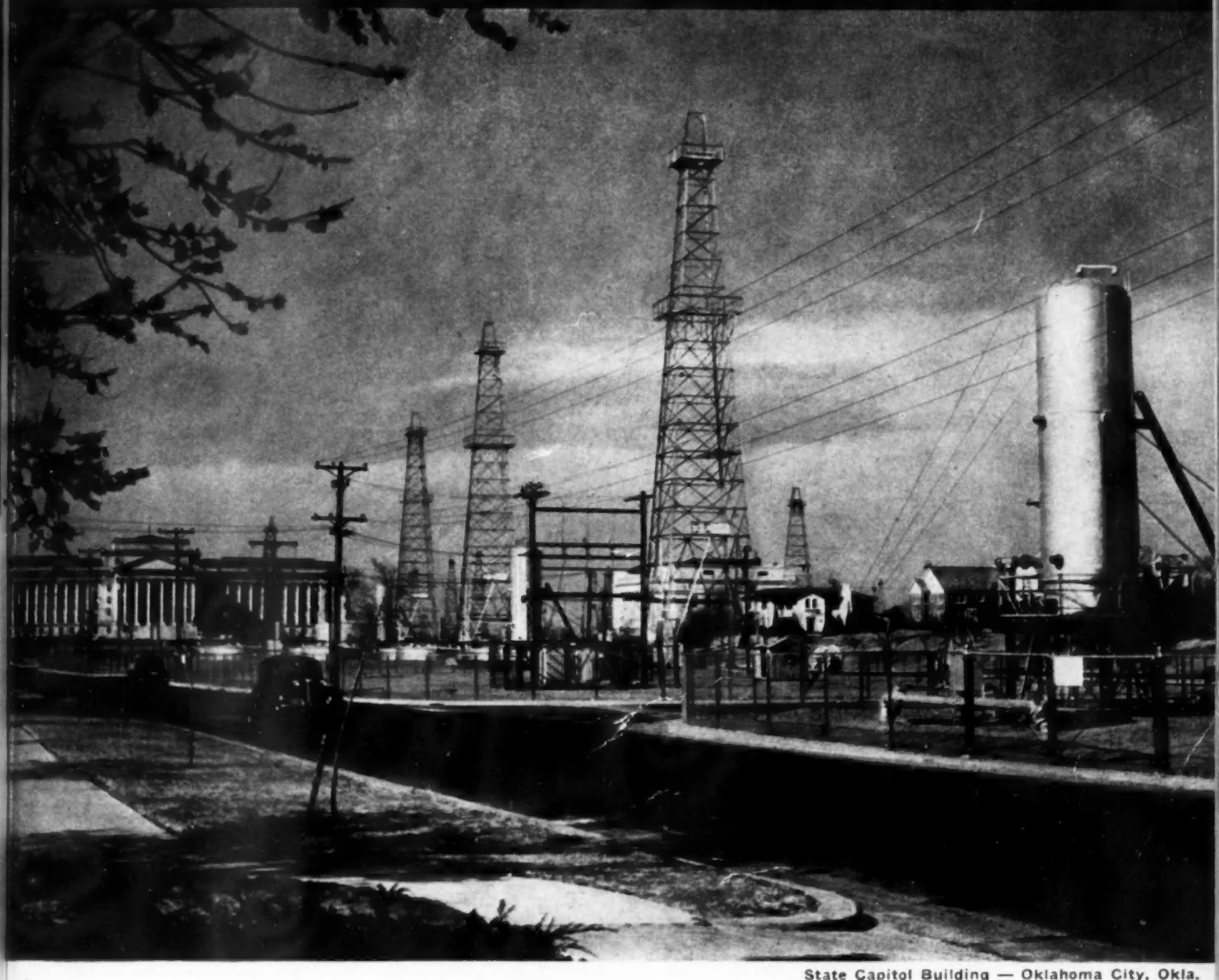
The OIL WEEKLY

INTERNATIONAL AUTHORITY FOR THE PRODUCING AND PIPE LINE INDUSTRY



State Capitol Building — Oklahoma City, Okla.

60,573,000 BARRELS, OKLAHOMA'S OIL PRODUCTION FIRST HALF 1944

hile the search for oil and gas in homa began in 1884, with an unsuc- ul well in Atoka county, the first mercial production was not reported 1891 and the real development with a flowing well near Bartlesville 903.

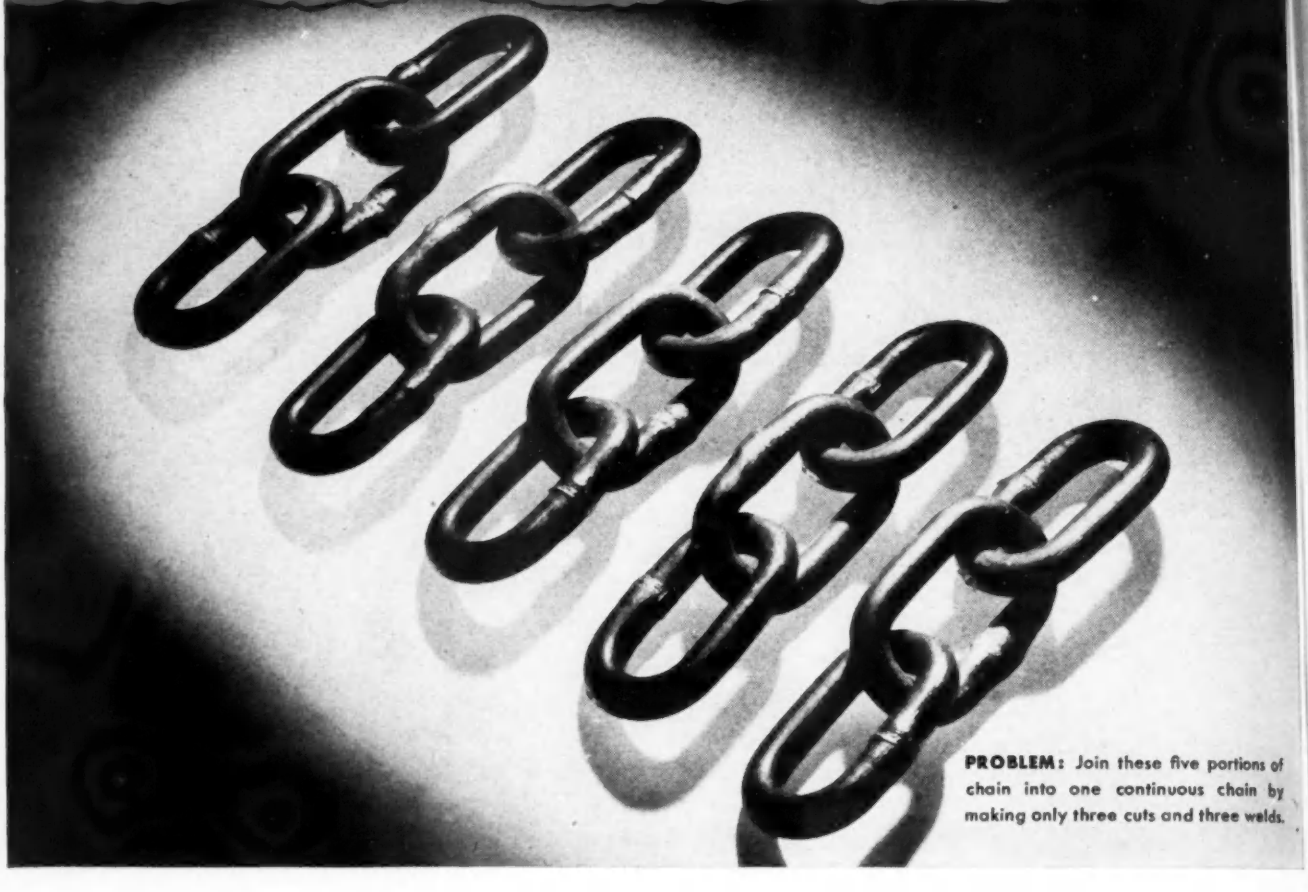
hat year fewer than 70 wells were ed and production approximated 000 barrels. In 1905, more than 2,500 wells were completed and over 8,000,000 barrels of oil produced.

With typical American initiative, the Petroleum Industry progressively developed the rich oil resources of this state to the point that during the first six months of 1944 she was able to produce 60,573,000 barrels of crude oil.

We salute the Oklahoma Oil Industry, and take pride in the part Hughes Tools have played in its development.

HUGHES
TOOL COMPANY
HOUSTON, TEXAS

Can you solve this one?



PROBLEM: Join these five portions of chain into one continuous chain by making only three cuts and three welds.

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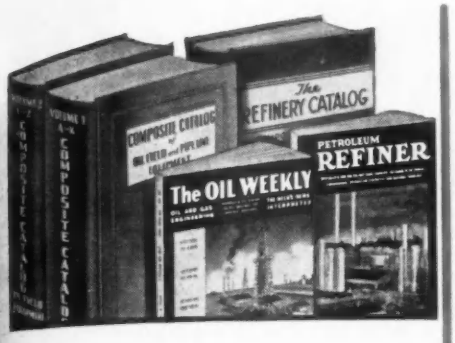

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The OIL WEEKLY and The COMPOSITE CATALOG for the drilling-producing-pipeline industry

PETROLEUM REFINER and The REFINERY CATALOG for the refining-natural gasoline industry

☆

LOOKING AHEAD
... with the Editor

CONSIDERABLE new territory has been opened for geological prospecting by the Alaska highway, including part of Alberta and Northeastern British Columbia. In these two particular districts, the Lower Cretaceous has a totally different sequence from that present in Southern Alberta.

Because of the occurrence of bituminous sands in the McMurray formation at the base of the Lower Cretaceous, the Athabaska area has been the subject of wide discussion for many years. Presence of these sands has also led to various proposals for and attempts at commercial exploitation.

The possible origin of the oil in relation to the general sedimentary sequence will be presented in an early issue by G. S. Hume, geologist for Canada. The author considers conditions in the Lower Cretaceous in this area exceptionally favorable for the occurrence of commercial oil deposits.

THE OIL WEEKLY

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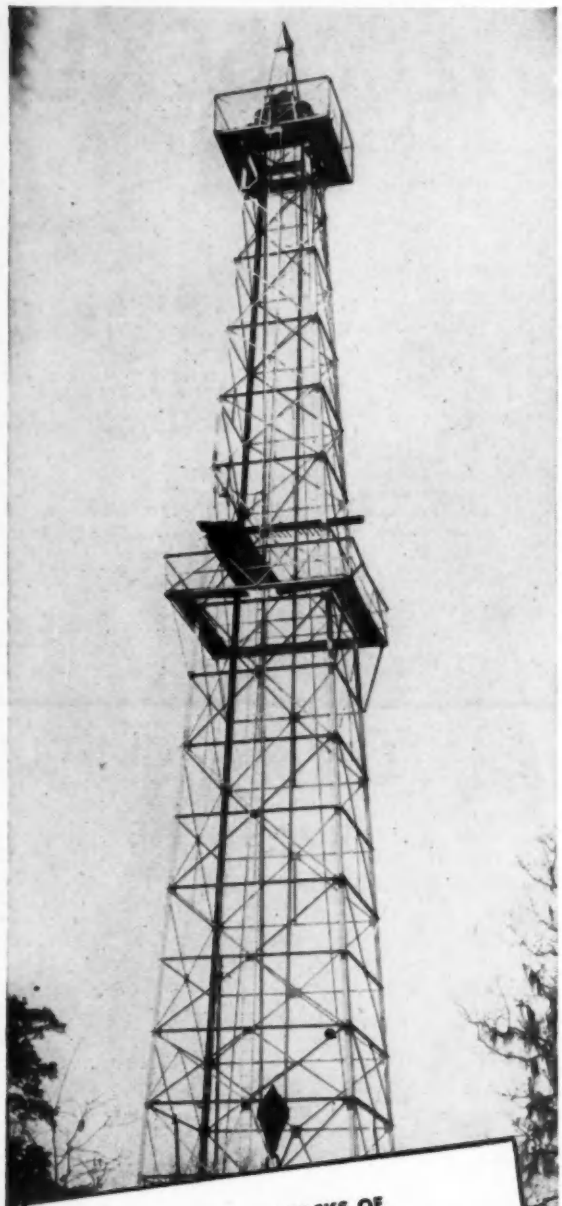

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The Changing Panorama

Study of Gas Regulatory Laws

INVESTIGATION looking toward a "constructive public policy" with reference to natural gas has been ordered by the Federal Power Commission (THE OIL WEEKLY, October 2, 1944), and oil men, as well as gas men, throughout the United States have a keen interest in its possibilities.

For some time the rumor has persisted in Washington that an effort would be made by forces of the administration to seek an entering wedge into the oil business via the natural gas route. Original rumors had it that the Department of the Interior would carry the torch. It is possible that the torch was snatched by the Federal Power Commission before the Interior had completed its plans.

In any event, action of the FPC brings the subject to the front.

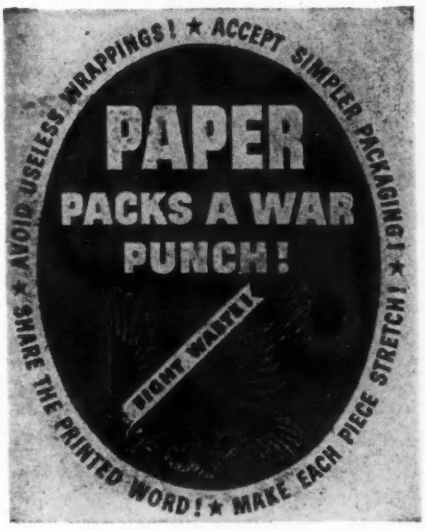
Some states which are large producers of natural gas do not have legislation adequate for the situation and unless they take an interest in such legislation we may see the federal government drive the wedge which will take that control from the states.

THE OIL WEEKLY believes in no regimentation and the minimum of regulation necessary to do a good job, both from the industry's standpoint and from the public's standpoint.

For several months we have been making a study of natural gas laws in various states, trying to determine which existing legislation is the soundest for all concerned. While legislation has been proposed in at least one state which appears to afford the maximum of protection to all interested parties, the State of Arkansas has adopted into law a bill which seems to be the best in actual effect today.

In an early issue we shall discuss the Arkansas law and give opinions on how it is operating, with the thought that this will stimulate state regulatory bodies in interested states, as well as oil and gas operators to constructive action.

In Texas, for instance, where natural gas is becoming of constantly increasing importance, the conservation laws on oil are superior to those on natural gas. The state government and the oil industry in Texas ought to do something about it before it is too late, because if it is left to the federal government, both the state and the industry will regret it.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SHARE THE PRINTED WORD! ★ MAKE EACH PIECE STRETCH!

There can be no greater fallacy than the belief that our export business is dependent on the economic retardation of other countries.

WILLIAM P. WITHEROW
National Association of Manufacturers.

An Embarrassing Error

MANUFACTURERS and publishers alike have their problems brought about by war conditions. On page 5 of this issue of THE OIL WEEKLY is a case in point, and a most embarrassing one to all concerned. The page carries a Cameron Iron Works advertisement.

In the rush to process the copy and get it into an early form two glaring errors occurred. The original copy described the valve as "The Only Valve Expressly Designed for Mud Line Service." It appears on page 5 as "The *Oily* Valve Expressly Designed for Mud Line Service," and as though that were not enough, the compositor used the letters "obsorb" instead of "absorb."

We're sorry for both errors—in normal times the entire form would have been rerun to eliminate the mistakes, but with paper rationing as it is, we are carrying this statement of error and apology in this, a later form, to go to press.—*The Publisher.*

We are entering an age of plastics, of chemurgy, of organic chemistry and the gate is wide open for the technologist with imagination.

—L. E. PARSONS,
Acting head of the
Department of Textile Engineering,
Texas Technological College.

Published Figure Of Oil Held by Government Absurd

IN THE OIL WEEKLY of August 21 a dispatch from Washington dealing with the proposed disposal of surplus properties by the government, stated: "Estimates also placed the value of tankers owned by the government at the end of the war at $1,970,000,000 and *$1,160,000,000 worth of petroleum products held by the government abroad and $1,000,000,000 worth held in this country.*" (Italics are ours.) A check made with our Washington office reveals that the estimates in the dispatch were given during a House debate on the surplus disposal bill by Representative Whittington of Mississippi and attributed to an unnamed responsible government source.

Of course, if the federal government holds a total of $2,160,000,000 worth of petroleum products at the end of the war, the stocks represented by this dollar figure could have a tremendous postwar effect on the industry. The question arose as to how many barrels of petroleum products would thus be represented. Using the most conservative estimates as to the value of petroleum products per barrel, it would at once appear that the federal government would have several hundred million barrels of oil on hand at the close of the war. Investigation indicate that the figure of $2,160,000,000 cannot have any foundation. The federal government simply does not have such stocks on hand now nor is it likely that it will have at the close of the war.

Another federal source of information, which we shall leave unnamed but in which we have confidence, says, with reference to the $2,160,000,000 figure, that "We, too, were startled . . . when we saw in the September issue of *Fortune* the $2,160,000,000 figure applied to petroleum products in the hands of the government. In *Fortune* the figure was attributed to the Surplus War Products Subcommittee."

It is our belief that the government neither holds now nor will hold at the close of the war stocks of petroleum products which could possibly represent a value of $2,160,000,000. It probably would be a violation of the gentleman's agreement between the publishing profession and the government to state just what those stocks now are, even if the accurate information was available. But it is no violation of censorship to say that the figure of $2,160,000,000 as a value is utterly absurd.

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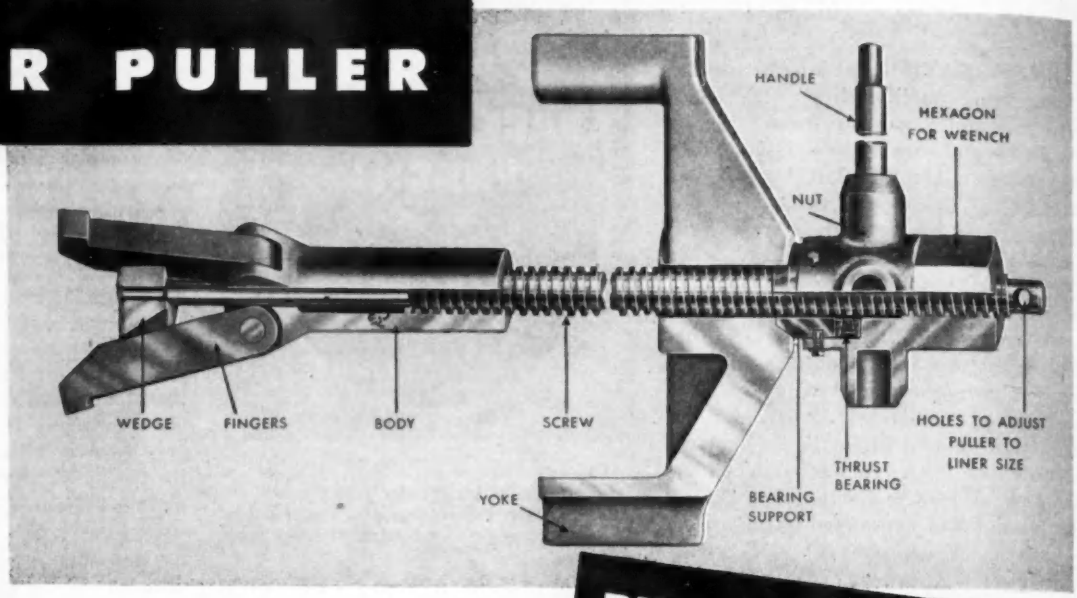

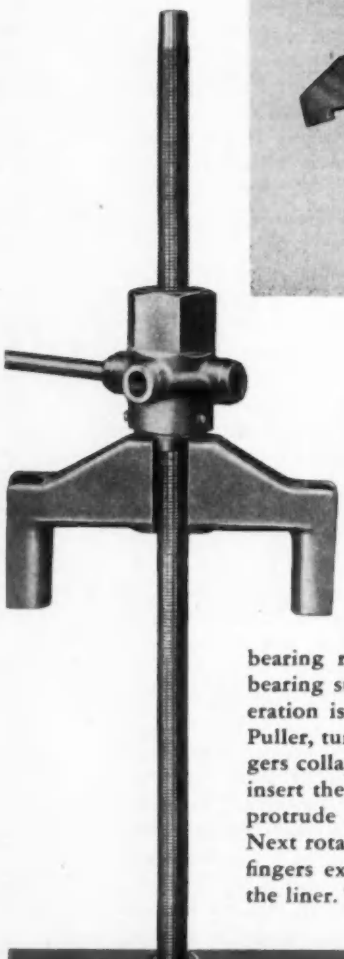

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"So Help Me God"

By RAY L. DUDLEY

I STOOD in the blazing sun at Ellington Field, in Texas, last Monday and watched the cadets file by, fine manly chaps, watched them come into the hall in which they were to receive their wings as commissioned officers in the United States Army Air Force. My third and last boy, a lad of 19, was among them.

Two years ago his mother and I had seen a similar group file into the chapel at Ellington to receive their wings, and our second boy was among them. Today he and his elder brother, who had chosen Navy Air, are memories, precious memories, it is true, but boys to be spoken of in hushed tones as boys who would have made good citizens, two boys whose memories will never be dimmed in the eyes of their father and mother. They, with thousands of others, have made the supreme sacrifice for America as they knew it and loved it.

Then Monday we heard again the prospective officers take the oath necessary to their commissions: *"I do solemnly swear that I will support and defend the Constitution of the United States against all enemies, foreign or domestic, that I will bear true faith and allegiance to the same; that I take this obligation freely, without any mental reservation or purpose of evasion; and that I will well and faithfully discharge the duties of the office upon which I am about to enter: SO HELP ME GOD."*

For a moment my thoughts drifted from the son whose burned body lies somewhere in France and from the other son who lies in native soil . . .

Our forefathers who wrote the Constitution knew that they were giving to future generations a document so precious that it would be worth the loss of American lives to preserve . . . and they knew that there would arise enemies to it, *domestic* as well as foreign.

Then my mind went back to a time nearly three years ago, when my first two boys volunteered, and the pledge I made them then:

"To the best of my meagre ability I shall do all I can to defend against foes at home the institutions you boys have enlisted to uphold . . . and I shall do that without fear of sacrifice if it costs me everything I have, including my life, so help me God."

It was not necessary that I pledge them my fullest efforts to help prosecute the war . . . they could have expected no less of me as an American and a father.

The casualty lists over the country name thousands of parents whose boys have been lost and whose sons are as precious to them as mine were to me. I claim no distinction as the parent of boys who have died in the service. *I can only claim to be among those to whom this war is a deadly serious thing,* and I wish my claim to be listed among those who resent with every atom of their being, the efforts which are being made by the Hillmans, the Browders, the Murrays and others, including our President, to nullify the sacrifices of thousands of American boys.

As I heard the oath to defend the Constitution repeated by the young men at Ellington, I could not but remember the remarks which have been made about it by Americans of foreign birth who would seek to destroy it . . . "a scrap of paper . . . an outmoded document . . . a bill of property rights rather than a bill of human rights." And these are the men who are asking that we trust our country to them.

The situation under which the Communist Front in America is trying to wield control over our country through the capture of one of our great political parties, is so preposterous as to be almost incredible. But make no mistake—the threat is a real one. That a Russian-born radical, with all of the class hate of his native land should aspire to control this country is so fantastic that many cannot believe it. But it is true.

That he and his fellows have openly boasted that their organization, the CIO, is raising millions as a war chest to help keep Roosevelt in power, indicates a blatant confidence in their victory. That this money should be extracted from hundreds of thousands of members whose membership was forced on them, is a disgrace. That they get away with it is a shameful tribute to the close association they have with our Department of Justice.

Who was it who climbed the stairs, hat in hand, to Hillman's suite in a Chicago hotel to learn the wishes of the boss as to who would be Democratic candidate for the vice presidency? It was our United States Department of Justice head—the man sworn to uphold our laws (including the Smith-Connally act which makes it a felony for a labor party, or a corporation, to contribute to a political party). Yes, it was Attorney General Biddle, and the man with him was the person who later was named by Hillman as the Democratic vice presidential nominee, Harry Truman.

With Hillman and Browder and their ilk as arrogant as they are now, what will their attitude be if they succeed in re-electing Franklin D. Roosevelt? Where will their power end? What will happen to the rights guaranteed under our Constitution? If our interests should ultimately clash with those of Russia at what point will these men make up their minds as to where their first loyalty shall lie? If England's interests should clash with those of Russia, will our country's armed forces be thrown against a nation whose kinship to us derives from a common parenthood?

This is a long way from the ceremony at Ellington last Monday. The field has widened until the lives of a large group of fine boys seem but a drop in a great ocean.

But it is not a long way from the pledge I made my boys.

OK, Mr. Hannegan

DURING the past week Chairman Hannegan of the Democratic National Committee, gave out a statement to the press saying that if the Republican nominee were elected it would mean the placing of great power in the hands of Joseph Pew of Philadelphia.

The oil industry is pretty well acquainted with the Pew family which has been engaged in the oil business and in civic and cultural affairs for two or three generations. The Pew family has a good reputation in the oil business, a reputation for being sound business men and a reputation for the interest of its members in helping to improve their communities. So when Mr. Hannegan offered Joe Pew as a bugaboo it just didn't register in the oil business.

As against Pew, who is the "powerful figure" who will emerge from the Democratic side—Hillman, Browder, Hague, Kelly?

OK, Mr. Hannegan—we'll take Joe Pew, and be thankful for the choice.

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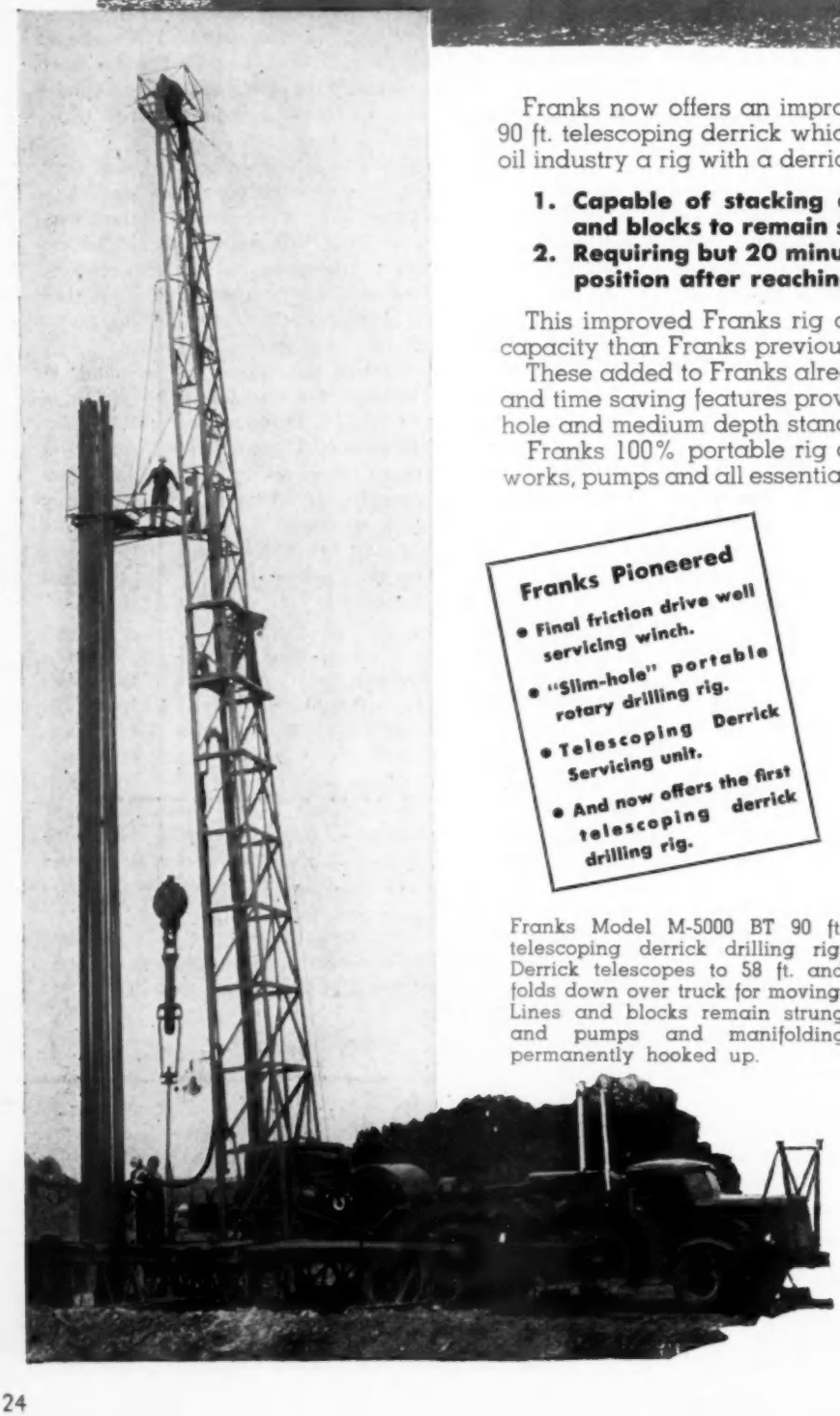

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This improved Franks rig also has a 20 per cent greater drilling capacity than Franks previous truck mounted drilling rigs.

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- **Final friction drive well servicing winch.**
- **"Slim-hole" portable rotary drilling rig.**
- **Telescoping Derrick Servicing unit.**
- **And now offers the first telescoping derrick drilling rig.**

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Tulsa, Oklahoma

WASHINGTON ROUNDUP

By BERTRAM F. LINZ, Washington Correspondent

CRUDE prices and synthetic rubber were the outstanding oil subjects of discussion in Washington last week.

Crude Price Increase—Following up its hearings at Austin last month, the House small business committee reiterated its demand for a 35-cent increase in crude prices, plus a stripper-well subsidy and, to prevent any increase in retail prices, a subsidy for high-cost refiners with no governmental war contracts.

Independents' Plight Cited—Submitting their recommendations to Stabilization Director Vinson, the committee asserted that independent producers are being driven out of business by the failure of OPA to provide reasonable crude prices, that the OPA's position is predicated upon the 1942 report of the tariff commission, erroneous in part and incorrectly interpreted where it was not in error, and that the stripper-well subsidy has failed to meet the situation at which it is directed.

Synthetic Rubber "Steal"—While the House group was taking up cudgels for the industry, Senator Guy M. Gillette of Iowa charged that the oil industry was attempting to steal the synthetic rubber program from the grain-alcohol producers and went to the White House to ask President Roosevelt to set up a three-man committee to make a study of the postwar possibilities of the alcohol plants. Gillette charged a secret agreement to freeze alcohol out of the rubber program, springing out of the oil industry's "alarm" over the success of alcohol-rubber production and designed to create an oil-owned synthetic rubber monopoly.

1945 Drilling Program—Drilling of 27,000 wells in 1945, of which 5000 would be exploratory, was called for by PAW as representing, not the number which would be desirable but the maximum possible in view of shortages of manpower, materials and facilities.

Readying for Reconversion—Orders for postwar delivery of materials and products now under priority or other restrictions may be placed with and accepted by suppliers and manufacturers, under new War Production Board rulings designed further to grease the way for a quick revival of civilian activity following the defeat of Germany.

Internal Revenue Ruling—Of interest to lease dealers was an Internal Revenue Bureau ruling that the interest of a lessee in oil and gas constitutes an interest in real property, regardless of state practice, and as such are excluded from tax treatment as capital assets, although if held for more than six months they qualify as property used in trade or business of the taxpayer.

Independent's Plight is Deplorable, Committee Says in Urging Price Increase

An immediate increase of 35 cents a barrel in the price of crude oil plus a stipper-well subsidy, and subsidies for independent refiners operating at high costs with no government contracts to avoid increases in retail prices was urged upon Stabilization Director Fred M. Vinson last week by the House small business committee.

The committee analyzed testimony taken at the Austin hearings September 20 and 21 and told Vinson October 4 that the OPA stripper-well subsidy has failed to stop the flow of complaints that present returns from crude are not sufficient to encourage independent producers to stay in business.

Following the conference, Chairman Wright Patman of Texas said that Vinson had promised to take the committee's recommendations under advisement and would give them and the Austin testimony "very careful consideration."

Attending the meeting were Patman, Representatives J. W. Robinson of Utah, Estes Kefauver of Tennessee, Walter C. Ploeser of Missouri and William H. Stevenson of Wisconsin, and J. K. Brim of Sulphur Springs, Texas, special counsel for the committee, and E. L. Lincoln of Texarkana, Texas, assistant counsel.

The committee found that:

1. This nation is withdrawing oil from its known reserves faster than new reserves are being discovered to replace it.

2. Exploration work is not being undertaken on a sufficient scale because the price of crude is too low to induce operators to engage in exploration.

3. In addition to the increase per well production allowable, the major companies have increased the amount of their crude production through acquisition of the holdings of independent operators obliged to sell because of low crude prices rather than through much new development work on their own part.

4. The major companies are making greater profits today than in 1945 but these profits are attributable to profitable pipe line, refining and merchandising operations and increased volume rather than to profitable producing operations.

5. The majority of the independent producers, not being possessed of pipe line, refining or direct merchandising facilities, are either losing money or not making sufficient profits to encourage them to stay in business. In many instances they are disposing of their holdings to the major companies. In other instances they are merely producing from existing wells. In very few instances are they engaged in new exploration or drilling operations.

6. Although the OPA has granted substantial increases in the prices of petroleum products, it has done practically nothing to encourage exploration and new production by means of price increases for crude oil except its present subsidy program, which is held to be ineffective for these purposes.

7. The basis for OPA's present schedule of crude petroleum prices is a report of the United States Tariff Commission issued in 1942. The report is held to be erroneous in part and to have been incorrectly interpreted by OPA in certain instances where it is not in error.

Operating Costs Up

8. All operating costs incidental to the production of crude have increased between 50 and 100 per cent, dependent upon well locations, during the past three years, but these increases have not been reflected in revised price schedules on crude oil established by OPA.

9. The present pricing policies of the OPA and Office of Economic Stablization, as evidenced by existing price schedules for crude, have acted to prevent new exploration, have worked a hardship upon the average independent producer, and have tended to encour-

age the concentration of the ownership of the crude production facilities of the nation in the hands of the major integrated concerns.

"The committee insists that its prior recommendations made over 18 months ago calling for a minimum increase of 35 cents per barrel on the average overall price of crude petroleum were in order then and are equally applicable today," it was asserted in the letter to Vinson. "Subsequent events have demonstrated the validity of these recommendations and it is the committee's opinion that the nation would have been better prepared today if these recommendations had been adopted when offered. There should be no further delay in the establishment of the recommended price increase.

Extra For Strippers

"Recognizing, however, that a 35 cents per barrel increase will not be sufficient to assure continued production from certain stripper wells, the committee recommends that a subsidy be given to this type of well so that its continued production may be assured.

"Although the committee is opposed to subsidies for exploration purposes, it recognizes that they may be used to advantage in the oil business as they have been used in the copper and other mining industries. Consequently, the committee recommends that consideration be given to increasing the price of crude oil without increasing the price of finished products to the consumer and, in order to carry out this recommendation, that subsidies be paid where necessary to the independent refineries whose operations are evidenced by high operating costs, by an absence of governmental contracts and whose products are sold entirely for public consumption.

"Because the plight of the independent oil producer is a deplorable one and because he will be forced out of business, leaving the field entirely to the majors and to those concerns using excess profits from unrelated business unless immediate relief is granted him, the committee recommends that these recommendations and the appended report be used immediately as a basis for affirmative action along these lines," it concluded.

New Tank Car Movement Rule Subject to Change

Fayette B. Dow, head of the ODT liquid transportation department emphasized October 5 that the recent cut from 200 to 100 miles in the minimum movement of tank cars without permit was in recognition of changed conditions and reduced average length of haul and that the current situation can be affected adversely and suddenly by changes in military requirements, the volume of other traffic, and weather conditions.

There is no indicated letup in the demand for tank cars in the immediate future, Dow said.

Tank trucks are now transporting an estimated 128,000,000 gallons of products daily, releasing many cars for long hauls to the Atlantic and Pacific Coasts, Dow said, and it is essential that these trucks be kept in active service, with no unnecessary diversion of their cargoes to tank cars.

Oil Industry Would Monopolize Synthetic Rubber at Alcohol's Expense, Says Solon

Senator Guy M. Gillette of Iowa last week asked President Roosevelt to set up a committee similar to the Baruch-Hancock committee to study the postwar use of the alcohol plants built for the production of synthetic rubber.

He charged the oil industry in attempting to steal the rubber production from the farmer "and secure a postwar synthetic rubber monopoly, by diverting premium grade gasoline components to synthetic rubber production at the expense of civilian supplies of such gasoline and, possibly, at the expense of high-octane aviation gasoline for our armed forces."

Gillette said the President was "sympathetic" to his proposal.

In a statement charging that oil was executing a squeeze play on grain alcohol, the Senator apparently overlooked the frequently publicized program of former Rubber Director Dewey to have oil take over an increasing share of the synthetic rubber production, now carried largely by alcohol. Gillette asserted that "I am advised that plans have already been made, secretely, to reduce the share of grain alcohol in the synthetic rubber program and increase the oil industry's share, despite the fact that alcohol production is now running in excess of all requirements and bumper grain crops are in prospect."

Reference to the Rubber Director's progress reports show that many months ago it was agreed that alcohol should carry the greater part of the rubber load until the second quarter of this year, when production of rubber from oil would begin to reach maximum volume. In his final progress report last July, Dewey also said it was planned to curtail production of butadiene from alcohol in this quarter, cutting it back to a rate of about 55,000 tons a year, and explained that the butylene situation was expected to be less critical and emphasized that "obviously, with the butadiene from alcohol costing about five times as much as that from butylene, only the great need for aviation gasoline justifies any but a minimum use of butadiene from alcohol."

However, Gillette said, "not only are the grain alcohol rubber plants—which saved the synthetic rubber program and have been by far the most successful units in the entire program—to be 'cut back' while additional contracts are given to oil interests, but also supplies of premium grade gasoline for civilians are apparently to be affected, and perhaps that of our armed forces as well.

Wants No "Diversion"

"Until all the requirements of our armed forces are met, both in combat and in training zones, and until adequate supplies of gasoline for essential civilian uses are provided, there should be no diversion of gasoline components to the rubber program. The only reason for such diversion appears to be the oil industry's alarm at the success of the alcohol rubber program which according to the last report of the Rubber Director has accounted for the greatest tonnage of synthetic rubber produced to date.

"Oil interests apparently are taking advantage of the solitary argument against alcohol rubber—the present abnormally high cost of grain—to 'squeeze out' alcohol and install themselves as synthetic rubber monopolists, before normal grain prices return and this argument is lost to them."

Tariff Commission Report

Possible bases for government aid in maintaining synthetic rubber production after the war were also the subject of discussion in a report on rubber issued during the week by the Tariff Commission which warned that the most important considerations in determining a postwar rubber policy are the necessity of insuring adequate safeguards to the national security and of protecting consumers against possible exactions of combinations of foreign producers, while avoiding unnecessary restrictions upon our foreign trade and unwarranted burdens on American consumers and taxpayers.

The report held there will be a period of perhaps a year or two until some time after the re-conquest of Far Eastern rubber producing areas—in which to observe the technical progress and other developments in the synthetic industry but, because of the complicated character of the problems involved, it is not too early to begin systematic study of postwar policies.

Crude Oil Production in the United States

(Estimates compiled by The OIL WEEKLY. All figures indicate daily averages, in barrels.)

STATE OR DISTRICT	PRODUCTION IN WEEK ENDED Oct. 7	Sept. 30
Alabama	300	300
Arkansas	80,800	81,050
California	895,000	890,000
Colorado	8,650	9,150
Florida	50	50
Illinois	194,800	210,400
Indiana	13,550	12,750
Kansas	251,300	277,400
Kentucky	28,750	24,600
Louisiana	362,750	362,950
North Louisiana	73,000	74,550
South Louisiana	289,750	288,400
Michigan	49,350	50,000
Mississippi	49,250	48,950
Missouri	100	100
Montana	25,550	23,310
Nebraska	950	600
New Mexico	104,750	106,100
New York	13,500	13,250
Ohio	8,000	7,550
Oklahoma	344,000	343,400
Pennsylvania	39,900	39,400
Tennessee	35	35
Texas	2,133,350	2,156,050
Upper Gulf Coast	537,750	543,000
East Texas Field	371,400	370,900
Rest of Eastern Texas	149,500	149,800
Lower Gulf Coast	236,800	243,250
Southwest Texas	77,750	79,050
South Central Texas	19,700	19,300
West Texas	492,800	504,150
North Texas	148,850	147,850
Panhandle	98,800	98,750
West Virginia	8,450	8,250
Wyoming	100,300	101,550
Total United States	4,713,435	4,767,195

Orders May Be Taken for Postwar Goods Deliveries

A green light for the acceptance of orders for postwar delivery of materials and products now subject to restriction was given manufacturers in all lines last week by the War Production Board.

WPB held that the present prohibition upon the placing or acceptance of orders for controlled materials and products, unless the orders bear preference ratings or are accompanied by an allotment symbol or special WPB authorization, does not prohibit "the placing or acceptance of a purchase order which by its express terms is not to be filled until after removal of such restrictions."

It was made clear that a manufacturer may not schedule such orders for production, order material or place material in production to fill such orders until after the applicable restriction is removed. Postwar orders, however, will need no priority or other ratings.

While the government is laying the paper groundwork for quick reconversion of industry, many officials who a few weeks ago were talking of reconversion in terms of the very near future are saying little currently and all planning now is on a more flexible if, as and when basis.

Straw guides to the future are seen in the half-dozen following factors:

The administration expects that business and not the government will take the lead in the shifting of production back to civilian goods—this on the word of such authorities as Mobilization Director James F. Byrnes and War Production Board Chairman J. A. Krug.

Paper and paperboard supplies will not increase for about ten months after the defeat of Germany, and until then present restriction will be maintained.

A number of bureaus, branches and other divisions of the war agencies will fold up in the near future, following the example of the conservation division of WPB, which was liquidated at its own request.

The greatest demand for military and civilian transportation of freight is due to develop this month, but the whole transportation situation will remain acute until Japan is defeated.

Selective Service, working quietly, has reduced its monthly draft calls to about 70,000 from 300,000 last spring, but no further decrease is to be expected for some months after the end of the war in Europe.

Much of the talk about tax revision is held to be only window-dressing. Federal statisticians and business and industrial interests are making plans and studies and Congress will make its own survey next month, but the fact is that delay in consummating the campaign against Germany has set back the time when tax revision can actually be put into definite legislative form.

Seeks Line Permit

Federal Power Commission has set a hearing in Kansas City, Missouri, October 20, on application of the Consolidated Gas Utilities Corporation, Oklahoma City, for authority to construct 2½ miles of 6⅝-inch pipe line in Cowley County, Kansas, and construct an additional 400-horsepower compressor unit and appurtenant equipment at its Pitsch compressor station in Wheeler County, Texas.

No Letup Seen in Demand as PAW Asks for 3000 More Wells in 1945

PAW last week called on the oil industry to drill at least 27,000 wells next year, 5,000 of them to be exploratory.

The 1945 program calls for 3,000 more wells than were asked for the current year which, while below the number which would be deemed advisable under more normal conditions with the current demand for more than 4,700,000 barrels of oil daily, is felt to be all that is possible in the face of manpower, materials and facility shortages.

Announcing the 1945 program, Deputy Administrator Davies disclosed that military authorities do not believe that the current rate of production can be substantially reduced during the coming months, even in the event of a quick victory in Europe.

"The petroleum industry has fully met the military requirements for petroleum and its products," Davies said. "The unprecedented size of these demands has placed an enormous strain on the productive capacity of the nation's oil fields. To sustain crude oil production at or near present levels, the rate of finding and developing new oil fields must be increased.

"Accordingly, PAW recommends that the petroleum industry drill at least 27,000 wells during 1945 and urges that at least 5,000 of these be exploratory wells. Although the industry, at PAW's request, has expanded its exploratory activity during this year, further expansion is needed to maintain the high production rates that are necessary to supply the armed forces and essential civilian requirements."

Currently, Davies said, drilling operations indicate that the lag in meeting the 1944 schedule in the first half of the year is being overcome. During the first six months, the industry was nearly 5 percent behind schedule on its drilling program, but it is expected that the more than 450 additional rotary rigs which have been put into operation will bring the total for the year to the 24,000-well total sought.

However, he pointed out, petroleum requirements have soared to unprecedented levels as a result of the increased tempo of military activities.

Demand Requirements Increased for October

Demand requirements for domestic crude this month are placed by the Bureau of Mines at 4,790,300 barrels daily, 466,700 barrels or 10.8 per cent, higher than demand in October, 1943 and 81,800 barrels above PAW certifications to the states.

On the basis of experience to date, the Bureau placed the probable daily average crude demand for the year at approximately 4,770,000 barrels, which will be 630,000 barrels over the demand in 1943 and 738,000 barrels or about 18 per cent, above the 1941 daily average. On the basis of present trends, it said, the total demand for crude will run at approximately 4,900,000 barrels for the final quarter of this year.

Production of domestic crude for the year, the Bureau stated, may exceed 4,580,000 barrels daily, an increase of 462,000 barrels over last year, and present indications are thta stocks of domestic crude may be reduced by an average of over 70,000 barrels daily for the year compared with an increase of 13,000 barrels daily in 1943. Imports of foreign crude are expected to average about 70,000 barrels daily.

PAW Follows Suggestions On Production Rulings

A progress report from the director of production for District 3, PAW, to the chairman of the production committee, PIWC, indicates all recommendations made by the committee for relaxation of rules on production of oil have been fulfilled.

At a meeting in Houston, June 15, the production committee presented recommendations for changes in PAO-11 to Deputy Petroleum Administrator Ralph K. Davies. By July 1 supplementary order No. 12 had been issued complying with the most important recommendations. Other orders of relaxation have followed, embracing all of District 3.

WPB to Fill Industry's Requirements for Steel

Full requirements of the industry for steel for the fourth quarter will be met by the restoration, announced last week by PAW, of 20,000 tons which had been cut from PAW's claim by WPB.

Deputy Administrator Davies explained the cut was made because WPB considered that inventories of oil country tubular goods were excessive, but a survey revealed the steel was badly needed.

At the time of the reduction, WPB agreed to reconsider the allocation if inventories did not reveal an excess of steel. The cut was approximately 20 percent of the amount asked.

Mexico's Expropriation Figure Finally Ratified

Ratification of the settlement between the United States and Mexico in connection with expropriation of United States oil companies, in 1938, was secured by the Mexican Senate last week.

Under terms of the agreement, Mexico's payment to five oil companies in the United States will be in addition to 3 percent interest from the date of expropriation.

The Mexican government's check for $4,085,327.45 was presented to the Secretary of State October 2 by the Mexican Charge d'Affaires ad interim. A balance of $12,255,982.35 remains to be liquidated by similar payments annually for the next three years to make up the $29,137,700.84 which it was agreed in September, 1943, should be paid the American companies for their properties.

Drilling Contractors Hear of Various Shortages and 27,000-Well Program

Members of the American Association of Oilwell Drilling Contractors, in Fort Worth last week, were told they would be called upon to drill 3000 more wells in 1945 than in 1944, that they were confronted with an immediate and serious shortage of butane; and that materials, manpower and truck shortages would continue.

Such an increase in drilling would mean plenty of work in 1945 for more rigs than now operating, and create a need for more men and more equipment than currently available. It was held that there could be little hope of any complete solution of the manpower and material problem until military requirements are substantially smaller than currently, and that there are no prospects for this at least until Germany is defeated.

Warning that butane rigs face a shutdown for lack of fuel unless contractors can find other fuels, came from James E. Pew, PAW director of natural gas and natural gasoline.

There is a "current shortage of 5 million gallons monthly in butane," he explained, "and this is expected to increase to 7 million gallons by January 1. The military, of course, has first call, for butane to make aviation gasoline and other critical items. Then, there also is the problem of supplying domestic consumers with liquefied gas."

Some users have converted to straight or mixed propane and other fuels, but Pew stated this was impossible in many cases because special storage tanks were required for propane.

Pew said that as much as he hated to it probably would be necessary for him to issue a directive banning butane use for drilling purposes unless contractors voluntarily converted. He estimated that there were 600 to 700 butane rigs east of California, and that if 200 rigs cut out the use of butane 6 million gallons could be saved monthly.

To alleviate the situation, 23 natural gasoline plants are under construction now, and "we are looking for more possible plant sites," he added, after explaining that the natural gasoline plant program was delayed because of the urgency of completing the aviation gasoline program. Pew did not believe that the end of the European war would have any influence on the butane shortage, for "use will be just as great during the Japanese war."

Most contractors said they are using natural gas where good quality is available because it is cheaper. A committee will meet with Pew and discuss the problem.

Want 27,000 Wells

The government drilling program for 1945 will call for 27,000 wells compared with 24,000 projected for 1944, J. R. McWilliams, director of production for PAW, revealed. The program calls for more wells in every district with the largest increases in Districts 2 and 3.

McWilliams explained that the present all-time peak demand for United States crude should not decline following defeat of Germany, but continue until "after the Japanese war ends, except for a temporary reduction while troops and material are shifted from Europe to the Pacific area." Consequently, at least 5000 of the 27,000 wells should be "wildcats, if we are to find sufficient oil."

Here is the PAW program for completions:

	1945	1944	Increase
District 1	4800	4300	500
District 2	9800	8630	1170
District 3	9800	8545	1255
District 4	600	580	20
District 5	2000	1945	55
Total	27,000	24,000	3000

Equipment Picture

Increase in rotary rigs in operation from 1294 in January to 1776 was heralded by Claude P. Parsons, PAW director of materials, as an important achievement. He warned that difficulties would increase as drilling operations expand, and that the problem of getting enough materials might be amplified.

Parsons gave essentially the same report he last presented to PIWC (THE OIL WEEKLY, September 18, 1944), but added there could be no improvement until Germany was defeated. However, he expects military cutbacks even with Japan still to be whipped "which would change the materials picture.

"All manufacturers are increasing their facilities for the manufacture of tool joints, and all such projects are being approved, but we are running into difficulties in getting lathes. However, we are making progress and expect tool joint deliveries to reach 45,000 monthly by January."

"To meet future equipment needs," Parsons continued, "we must either expand oil-equipment manufacturing facilities or shift war work from oil field shops to other plants. We can get raw materials for our needed products if this can be done." He urged every contractor to make available to other contractors any surplus materials on hand.

More Wildcats to Be Drilled

The United States will have to drill more wells, especially wildcats, after the war, if it is to maintain its producing position, E. DeGolyer of DeGolyer & MacNaughton, Dallas, said.

"Fewer new prospects are being found by geologists and geophysicists, which indicate the bulk of new oil in the future must come from stratigraphic traps," he said. "This means that we are exhausting our discovery means and must depend more than ever upon drilling to find oil. We have no way of finding stratigraphic traps, so it is likely we will have to drill 4 or 5 times as many dry holes as in the past."

DeGolyer said that failure to find as much new oil during the past six years as has been produced would likely show itself in the drilling program of the next several years. "We are dependent upon new fields for our current oil production, and these can be found only by the drilling of a great many exploratory wells," he declared. "A study made while I was a member of the PAW staff disclosed that if no new wells were drilled, the nation's producing ability likely would decline 50 percent at the end of four years..

"It is the new wells that keep the nation's production up. There should be much wildcatting in the postwar years."

World Oil Pact Denounced

Declaring that such federal regulation as proposed in the Anglo-American oil agreement would be the "downfall and destruction of the independent drilling contractor," Arch Rowan, association president, urged members to protest its ratification. "I deem," he said, "the ratification of the treaty contrary to the best interest of the drilling industry in the United States of America. I believe that the regulation of the oil industry by the several states has proven to be in the public interest, and I do not think that federal regulation could improve upon conditions existing before the war."

The proposed "treaty vitally affects every man in the oil industry, whether he be producer, refiner, transporter of petroleum, or a member of a service organization, such as the independent drilling contractor," he declared. If ratified it will give the Congress power:

"(a) To regulate and allocate production upon the consideration of available reserves within various oil producing nations of the world, co-jointly with the British and future signatories; and

"(b) To make allocations and production quotas upon the basis of a determination of 'sound engineering practices' that may or may not be wholly or partially observed, from time to time, in various produincg areas of the world; and

"(c) To make allocations and production quotas in various areas of the world in relation to what may be considered 'relevant economic factors'; and

"(d) To make allocations and production

Officers Selected by Drilling Contractors

Howard P. Holmes, Two States Drilling Company, Dallas, was elected president of the American Association of Oilwell Drilling Contractors last week, succeeding Arch Rowan, Rowan Drilling Company, Fort Worh.

Howard P. Holmes

Other officers elected were: William T. Payne, Big Chief Drilling Company, Oklahoma City, vice president-at-large; J. E. Warren, Carl B. King Drilling Company, Midland, vice president for West Texas-New Mexico; James D. Leonard, Leonard Drilling Company, Mt. Pleasant, Michigan, vice president for cable tools; H. E. Hamilton, Houston, vice president for the Gulf Coast; Ralph W. Marshall, Drilling & Exploration Company, Los Angeles, vice president for California; Will I. Lewis, Mt. Vernon, Illinois, vice president for Illinois-Michigan-Indiana-Kentucky; K. B. Knox, Petroleum Well Servicing Company, Houston, vice president for well servicing; Gifford C. Parker, Parker Drilling Company, Tulsa, vice president for Central Mid-Continent and Rocky Mountain; Harry W. Bass, Harry W. Bass Drilling Company, Dallas, re-elected treasurer; and Brad Mills, re-elected executive secretary.

quotas in various producing areas of the world on what may be assumed to be the interest of 'producing countries'; and

"(e) To likewise make allocations and production quotas in various producing areas of the world in relation to 'the interests of consuming countries'; and

"(f) To make allocations and production quotas with a view to the 'full satisfaction of expanding demand', all of which spheres of asserted congressional power are new adventures in asserted federal authority that must derive from a duly ratified treaty enjoying the dignity of the supreme law of the land."

Rowan also warned of a possible effort in Congress to abolish the intangible drilling charge-off in the revenue laws next year, and urged each member "to protest vigorously against such a move."

Warned of Centralized Government

From Texas' Lieutenant Governor Smith came a warning regarding the dangerous trend toward centralization of power in the federal government, and "the growing enslaving of sovereign states by giant bureaus."

Robert C. Sharp urged appointment of a safety practice committee and adoption of a safety code. "The rewards of a successful safety program," he said, "are not all to the workers."

Better crew morale resulting in more efficient drilling in addition to actual dollars and cents savings are derived by companies.

Lighter Equipment Probable

Declaring that the one thought of all operators is to maintain or increase capacity and decrease weight, John A. Chapman, Grey Wolf Drilling Company, Houston, stated that the greatly increased production of lighter metals would "undoubtedly be of some assistance in reaching this objective." Improvement in metallurgy should permit even further weight reductions in the near future, he thought.

He listed engines, traveling blocks, crown blocks, rotary tables, swivels and other items as promising to have greater capacities and still weigh less than before the war. Of importance in achieving this end, he said, would be the recent advancements in bearing capacities.

Mines Bureau Establishes Synthetic Fuels Office

Establishment of an office of synthetic liquid fuels in the Bureau of Mines to carry out the five-year program of research and development to produce oil and gasoline from coal, shale and farm and forest products, was announced October 7 by the Interior Department.

Dr. W. C. Schroeder, with the Bureau since 1935 and assistant chief of the fuels and explosives branch for two years, has been appointed acting chief.

The developing of synthetic liquid fuels will be divided among four divisions: Research and development division, to be headed by Dr. Henry H. Storch; synthesis gas production division, headed by W. W. Odell, and a hydrogenation demonstration plant division and gas synthesis demonstration plant division for which chiefs have not yet been appointed. In addition, a new oil shale section has been set up in the Bureau's petroleum and natural gas division, under Albert J. Kraemer.

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ROBERT B. TOTTEN, formerly associated with Phillips Petroleum Company, is now stationed at Tyler by Sun Oil Company, doing geological work in South Arkansas and North Louisiana.

Advisory Groups Named to Help Solve Stripper-Well Subsidies Problems

Appointment of 15 advisory committees to assist in handling problems arising in connection with the stripper-well premium payment plan, representing both independent and major producers, was announced October 6 by OPA.

The committees will be responsible for developing information relating to pools under the subsidy plan and OPA expects them to study problems relating to engineering and geological matters.

The groups will be headed in Italy by temporary chairmen pending the holding of formal meetings and the election of permanent chairmen by the committees themselves. Additional committees may be appointed later for areas not covered by the current setup.

Membership of the committtees is as follows: Oklahoma, District 1—T. M. Leach, Tulsa, temporary chairman. Eli Wilkomson, Tulsa. Raymond N. Garr, Sinclair Prairie Oil Company, Tulsa; Felix Quinlan, Beggs, and James S. Wise, Okmulgee.

District 2—W. E. Leroux, The Carter Oil Company, Seminole, temporary chairman; J. D. Campbell, Seminole; C. C. Lutz, The Pure Oil Company, Seminole, and J. E. Hall, Holdenville.

District 3—Wards Merick, Ardmore, temporary chairman; A. R. Patten, The Texas Company, Ardmore; A. H. Proctor, Magnolia Petroleum Company, Oklahoma City; G. W. Roodhouse of Simpson and Roodhouse, Ada, and S. J. Siard, Mudge Oil Company, Duncan.

Colorado: George L. Kay, Denver, temporary chairman; Leslie R. Steele, Boulder.

Montana: H. B. Gernert, The Texas Company, Cut Bank, temporary chairman; James W. Johnson, Shelby; Ray A. Klugh, Conrad; A. F. McClaine, Barmac Production Company, Ferdig; and H. W. Day, Sunburst.

Louisiana: L. G. Hughes, The Texas Company, New Orleans, temporary chairman; Earl H. Harter, Shreveport; R. L. Gay, Swolle, and C. Phillips, Gulf Refining Company, Shreveport.

Michigan: Robert Tope, Talbot Oil Company, Mount Pleasant, temporary chairman; T. E. Cain, Nollem Oil and Gas Corporation, Mount Pleasant, and C. E. Hyler, Muskegon Development Company, Muskegon.

Kentucky: M. A. Arvin, Sohio Petroleum Company, Owensboro, temporary chairman; M. G. Powers, Bedrock Petroleum Company, Huntington; J. C. Preston, Kentucky Oil and Gas Association, Owensboro; N. W. Shiarella, Owensboro, and M. W. Flowler, South Penn Oil Company, Irvine, Indiana; B. C. Vanhook, Cordova Oil Properties, Vincennes, temporary chairman, Joe Burke, Boundary Oil Corporation, Portland; I. G. Burrell, Ohio Oil Company, Marshall; Kirk D. Holland, Princeton; and V. E. Bolyard, Indianapolis.

Illinois: George P. Ellison, Ashland Oil and Refining Company, Grayville, temporary chairman; J. S. Germer, The Pure Oil Company, Olney; Carl B. Anderson, Gulf Refining Company, Mattoon; Edward T. Robinson, Smokey Oil Company, St. Louis, Missouri, and J. P. Tischner, Sohio Petroleum Company, St. Louis, Missouri.

New York, West Virginia and Pennsylvania: W. J. Brundred, Brundred Oil Corporation, Oil City, Pennsylvania, temporary chairman; George J. Hanks, South Pennsylvania Oil Company, Oil City, Pennsylvania; H. J. Lowe, The Pure Oil Company, Newark, Ohio, and J. P. Jones, Pennsylvania Grade Crude Oil Association, Oil City, Pennsylvania; George Holbrook, Bradley Producing Corporation, Wellsville, New York.

North Texas: Edward G. Kadane, Kadane Griffith Oil Company, Wichita Falls, temporary chairman; J. D. Bright, Perkins and Cullum, Wichita Falls; James Nash, Reno Oil Company, Wichita Falls; John C. Foffey, Deep Oil Development Company, Wichita Falls, and J. H. Cable, Cable Oil Company, Wichita Falls.

Ohio: Philip N. Faine, Pennsylvania Grade Oil Producers Association, New Straitsville, temporary chairman; C. H. Schwyn, Security Oil Corporation, Cygnet; D. T. Ring, Preston Oil Company, Columbus; H. G. Dispain, Industrial Gas Corporation, Newark; G. D. Keller, Thistle Oil Company, Corning, and W. L. McCloy, Jr., Standard Oil Company, Cleveland.

Kansas: L. M. Ahyes, Independence, temporary chairman; Mack C. Colt, Oko Oil and Gas Company, Iola, and W. N. White, Consolidated Gas and Oil Company, Independence.

New Mexico: C. J. Dexter, Grayburg Oil Company of New Mexico, Artesia, temporary chairman; Van S. Welch, Artesia, and Sam Sanders, Artesia.

Stripper Pool Payments

The Office of Price Administration last week issued formal orders providing for the payment of stripper-well subsidy on various pools, beginning October 1, as follows:

Illinois, Dundas Consolidated, Richland and Jasper Counties, 25 cents.

Indiana: Rockport, Spencer County, 35 cents.

Kansas: All pools in Crawford County, 35 cents; Kruse, Rooks County, 25 cents; Hollow-Nikkel, Harvey County, 20 cents.

Oklahoma: Platter, Osage County, 35 cents; Sams (Pennsylvania), Noble County, 35 cents; Sams (Oswego) Noble County, 35 cents; Reed, Garfield County, 25 cents.

West Virginia: All pools except those producing Pennsylvania grade crude, 35 cents.

Wyoming: North La Barge Unit Area, Sublett County, 35 cents.

Ruling Says Oil Leases Constitute "Real Property"

Interest of a lessee in oil and gas constitutes an interest in "real property" for federal income taxes, regardless of the characterization by the states, the Internal Revenue Bureau ruled.

Such leaseholds, held by a dealer therein, constitute "real property used in the trade or business of the taxpayer" and as such are excluded from the term "capital assets," it was ruled, but if they are held for more than six months they qualify as "property used in the trade or business."

"Prior to the amendment of Section 117 of the Code by Section 151 of the Revenue Act of 1942," the bureau explained, "leasehold interests, whether realty or personalty under state law, were within the capital asset classification. Machinery and equipment and other depreciable property were, however, specifically excluded from this classification. In the amendments made to Section 117 of the Code by the Revenue Act of 1942, Congress considered it 'more appropriate to treat all property used in the trade or business alike, and not to distinguish between land and other property used in the trade or business.'"

The bureau ruled that leases may be sold on the installment plan, and gains from the sale of leases which are treated as capital gains under Section 117(j) may be reported on the installment basis under Section 44 of the code if they otherwise meet the requirements of that section and regulations thereunder.

Leases acquired with the intention of producing oil or gas but sold before production are treated the same as producing leases, but those acquired and held for a time and sold without being drilled by a dealer in the ordinary course of his trade or business, are excluded from the term "capital assets."

Opposition to Federal Control of Industry Aired at Compact Meeting

Opposition to federal control of the nation's oil and gas industry was the principal subject of discussion at the meeting of the Interstate Oil Compact Commission in Oklahoma City last week. Ten of the 13 member states had representatives present. Florida sent two observers and there was an unusually large attendance of top-flight executives from industry.

Attacks on the proposed Anglo-American oil agreement were the subject of most of the speeches but speakers took advantage of the opportunity to condemn recent moves of the Federal Power Commission to investigate reserves of gas and waste in the course of its production. Observers commenting on this move invariably interpreted it as another effort to obtain federal control of the oil industry, this time by a different federal bureau.

N. W. Shiarella, representing Kentucky, sounded a warning and urged that those states which, like Kentucky, had no conservation law or one which was inadequate, act promptly to provide for waste-prevention statutes to become effective as soon as the war ends, so that he "Secretary of he Interior cannot go to Congress" and ask for authority to control these properties because the states have refused to do so.

He also urged that the Southeastern states where oil development is proceeding be brought into the Compact, and suggested that the December meet be held in that area to acquaint those states with the purposes of the Commission.

State Cooperation Needed

OPA representatives, in a preliminary conference, outlined the subsidy program to representatives of the state regulatory bodies and explained to them the need for state cooperation. This cooperation is to be in the form of information to be supplied defining the limits of oil fields to which payments might be made. No subsidy payments will be made to any lease unless an entire oil field is included, OPA said, so that there is no way in which any individual lease might get a subsidy payment if the field in which it is located averages more than nine barrels per well per day. Subsidy payments because of high operating costs also will be made on a field and not an individual lease basis. Each separate reservoir will be considered, and the regulatory authorities of each state will be asked to define the limits of these reservoirs. However, in a field where there are two or more reservoirs, one of which averages less than nine barrels production, while others average more, the poorer reservoirs would be allowed a subsidy if the production is segregated so that the average can be determined accurately.

Ralph T. Zook president of the Independent Petroleum Association of America, attacked the Anglo-American oil agreement as a threat to the independent producer. He pointed to the fact that from the legal standpoint, such agreements are treaties which supersede state laws. Zook was one of the industry advisors who asssited in the preliminary conferences leading to the draft of the treaty, but his recommendations were not followed, he said. He urged that such an agreement should have dealt exclusively with the orderly offering of oil in international trade, and that any commission formed to carry out this agreement have advisory powers only.

Loss of the postwar market for American crude will result from the treaty as signed, Zook said. He fears a flood of cheap foreign oil that will break prices here and eliminate further prospecting for domestic fields. While DeGolyer had estimated Middle East reserves at 25 to 27 billion barrels, Zook had heard estimates of 200 billion barrels for that area. If the Saudi-Arabian pipe line is built, which Zook believes will be done after the war, and if that oil is shipped through the Suez Canal, it can be delivered in New York for $1.35 per barrel, as compared with $1.60 for East Texas crude.

Urges Opposition

Reserves in the Caribbean area and South America amount to 7 billion barrels, Zook said, and production is now up some 300,000 barrels daily, and a like amount will be available from the Middle East. Thus the United States may be faced with the invasion of 600,000 barrels daily of this foreign crude. He urged the Compact to oppose the agreement when hearings are held before the Senate foreign relations committee late this year.

"The independent oil producer," Zook said, "must be alert to the effects of this agreement on his future. Approval by the Senate could readily lead to complete federal control of the oil industry, something he has fought against for years. He must be equally alert to what may happen in world oil markets at the end of the war. Constructive steps should be taken to avoid a world oil war that would greatly influence his ability to continue in business as an independent producer.

"It (the Anglo-American treaty) should not be approved as written. If it is a case of 'take or leave it,' then I say, let's leave it."

Russell B. Brown, general counsel for the Independent Association, pointed to the Arabian pipe line, government control of crude prices, federal conservation of domestic oil "by using somebody else's oil," and formation of the War Petroleum Corporation. As leader of a forum discussion on the subject, Brown wondered whether the Anglo-American agreement might not be regarded as part of an international oil philosophy, whether that philosophy might "contemplate the opening of our domestic markets to foreign crude oil on unlimited scale."

Hill Presents Case

George A. Hill, Jr., of Houston, presented a carefully documented case against the agreement (see THE OIL WEEKLY, September 18), which he had sent to each member of the Compact. With it he had copies of clippings from newspapers throughout the United States, including a great deal of editorial comment condemning the treaty.

Pogue on Oil Pact

Joseph E. Pogue, vice president of the Chase National Bank of New York, said the long-range aim of the international oil agreement is to facilitate the orderly and efficient "development of the world's oil resources, avoiding on the one hand those repressive forces which make for an inadequate supply, and preventing on the other hand the hasty exploitation of rich deposits in such manner as to cause surpluses with their train of wasteful consumption and disinvestments." (Complete report of Pogue's address starts on page 32.)

Adjustment of the world industry to the impacts of changes brought about by the war is the more immediate purpose of an international oil agreement, he pointed out.

There has been much confusion of thought as to the objectives of the agreement, Pogue said in urging observation of a few simple principles "as developed in the experiences of the oil industry in the United States," to avoid confusion about what is sought.

"An international oil agreement," he said, "should be free from implications of force or compulsion, and its administration should proceed upon a consultative and advisory level. Its findings must be of the highest technical proficiency. Its proposals should be open to voluntary acceptance by operating units, but no restrictions should be imposed upon compliance with such recommendations by our nationals. And inasmuch as governments and industry are joint parties in interest, it is essential for good results that industry be adequately represented."

Asks PAW Plans

Reviewing his efforts to get definite plans from PAW on the liquidation of the agency after the war, Beauford H. Jester, chairman of the Railroad Commission of Texas, made a plea for united action from oil producing states on this matter.

The Railroad Commission of Texas has decided that the "safe and proper way to regain full and complete state regulation of oil and gas in Texas at the end of the war is (1) to begin now to enlist the aid of the Congress of the United States and (2) to strengthen, where necessary, during the coming session of the Texas Legislature, our oil and gas conservation laws," Jester declared. He recommended the same procedure to other states where oil and gas are produced.

Such a course, the Railroad Commission chairman believes, is made imperative due to Administrator Ickes' "lack of definite assurance; his failure to fully answer" certain questions put to him on PAW liquidation; and his overlooking many of PAW's regulations affecting the industry and state regulatory bodies.

Granted that PAW Administrator Ickes means all that he says when he reiterates that PAW will end with the winning of the war, Jester thinks that "there is justifiable cause for the belief that federal control of oil and gas after the war will be advocated in Washington." Such control is favored by "certain officials high in governmental places. Specific governmental proposals have pointed to it." The speaker then

cited as examples, the proposed Petroleum Reserves Corporation, proposed "government financing of the $300,000,000 Saudi-Arabian pipe line," and the most recent, the proposed Anglo-American oil agreement.

Prevent Federal Control

Such control of oil and gas "by and through some other administration, board, bureau or commission or other governmental device after the war," must be prevented, Jester emphasized, "if we are to regain our state control and regulation of oil and gas." "If the oil and gas industries are to survive," he continued, "as private enterprises, the leaders of these industries should join now with the members of the Interstate Oil Compact Commission, the state oil regulatory bodies and the people of oil-producing states in joining in the fight for the termination of federal control after the necessities of war time coordination end and the establishment of state conservation, regulation and control of oil and gas.

States must be ready to assume and administer conservation the day that peace comes and the instant war emergencies go.

As a course for immediate action in this direction, Jester repeated the admonition given the members of the Compact Commission by Chairman Schoeppel, in New Orleans last April, when he said: "States which already have conservation laws and properly constituted authorities administering those laws should immediately begin to take a careful inventory of their situation. They should determine whether their statutes are adequate, whether their rules and regulations are proper and whether their enforcement methods are sufficient. Statutory changes should be recommended and urged on their legislatures. Just because we had something that 'got by' two or three years ago doesn't mean that we are ready to meet the challenge that victory must bring." To this recommendation, the speaker urged that states which have no conservation laws should promptly provide themselves with such measures as will protect their oil and gas reserves and be sufficient to prevent any intrusion of federal control.

With proper conservation laws, oil-producing states are then in position to say that "all that is needed from the national government to guide them in their oil production is the Bureau of Mines' monthly estimate of probable market demand as it was published before the war."

Stripper Subsidy Difficulties

Difficulties of administration of the subsidy program were outlined by Robert H. S. Eakens of the petroleum branch of the fuel division of the OPA, who explained the program to be followed in fixing subsidies for high-cost properties.

He said that the amount of the adjustment would be determined by the operating cost of the property on a per barrel basis, plus 60 cents per barrel, less the price being paid in the field. The difference would determine the subsidy, providing the difference does not exceed 35 cents. If the operating cost in a field is 75 cents per barrel, 60 cents would be added, making $1.35. Then if the price is $1.15, the subsidy would amount to 20 cents.

Every effort is being made to provide for simplified methods of calculating costs, and limited reports from the producers who must file them. The direct operating expenses of the properties are to be used; the 60 cents added represents all other items of expense. The producer must furnish his production and sales reports, the number of producing wells on his property, and about 10 individual cost items. The data must cover the last four calendar quarters preceding the date the application is filed. No administrative expense such as district offices, will be permitted in these calculations.

On the basis of these calculations, adjustments will be made to the nearest cent. Eakens said that no subsidy will be granted if the producers are not already getting the ceiling price for thier production. Neither is a producer eligible for subsidy if he sells directly to the consumer who uses the oil for fuel. Under this plan the producer would be entitled to receive the fuel oil price, not the crude oil price, and crude only is covered by subsidy.

Must Furnish Data

As production declines in fields not now eligible for subsidy, so that they produce an average of nine barrels or less they may apply for the subsidy and be included. However, they must furnish production data monthly for the past year. Eakens said that OPA wants to rely on the state agencies to determine the boundaries of the various oil reservoirs, thus establishing the leases which are eligible for subsidy. Where there is doubt about division between fields, he asked that all data be submitted, so that OPA may decide. Conditions may warrant subsidy grants as a practical matter, even in fields where all of the production is not subsidized, and the oil from different reservoirs not segregated.

OPA is now setting up industry advisory committees to assist with the high-cost problems, and to supply technical advice where it is needed, Eakens said. He expressed a desire to supply full information concerning OPA activities to state regulatory authorities so that they would be fully advised at all times and can better help their producers who are entitled to benefits under the program.

Conservation Practices Book

E. DeGolyer, reporting for the engineering committee, said that plans were proceeding for compilation of its printed report, which will take about six months to compile. The compact has appropriated $5000 for this booklet describing conservation practices.

Warwick Downing, Colorado, said that the public lands committee wanted to protect the new act providing for disposal of government surpluses. He objected to a clause which provides that the government shall retain mineral rights to lands it sells to the public unless the purchaser was the former owner of the property, or is a veteran. He said that this clause had been inserted in the bill at the request of the Department of the Interior.

Representatives of the newly-created industry advisory committees reported ready to assist the Compact. Speaking for the Texas division of the Mid-Continent Oil and Gas Association, Wallace Hawkins urged that the Compact assist officials of Florida in the preparation of a conservation law, and pointed out that the legislature meets there in April. He urged, also, that Mississippi be encouraged to enforce the 1938 conservation statute, which Hawkins said might be too general but was certainly sufficient. He thought Mississippians about ready to accept "equitable distribution" of allowables, although opposed to "proration." He pointed out that they have pipe line proration now whether they like proration or not. Enforcement, he believes, might be helpful.

Representatives of the Texas and Kansas division of the Mid-Continent Association, the New Mexico Oil and Gas Association, the newly-organized Independent Natural Gas Association and the Independent Petroleum Association of America, likewise reported ready to support the compact.

McWilliams Attends

In attendance at the meeting were representatives of PAW, including its Chief of Production McWilliams, who recently succeeded D. R. Knowlton.

Interviewed privately McWilliams expressed the opinion that there would be no decrease in the demand for domestic crude for military purposes when the war with Germany is ended. The Army has already advised PAW that its demand will be the same. McWilliams could not account for recent forecasts by private concerns which have predicted that there would be a drop of 200 or 300 thousand barrels daily in the demand for domestic crude when and if Germany surrenders.

West Edmond Report

Dean McGee, executive vice president of the Kerlyn Oil Company, read a paper on the new West Edmond oil field, located in Oklahoma, Canadian and Logan Counties, Oklahoma. He estimated that the field might include 35,700 productive acres. There are 164 producing wells, 120 wells drilling, and 608 wells to be drilled. He estimated October production at 39,725 barrels daily, and thought this would raise to 92,750 barrels daily by May, 1945.

Interstate Oil Compact Advisory Groups Named

Each division of the Mid-Continent Oil & Gas Association has appointed an advisory committee to the Interstate Oil Compact Commission, in response to invitations extended earlier in the year. Names of the committees and the members for 1944 are as follows:

Advisory committee to the Interstate Oil Compact Commission, representing the Louisiana-Arkansas-Mississippi Division — A. H. Tarver, chairman, Shreveport, Louisiana; A. R. Campbell, Mid-Continent Oil & Gas Association, Shreveport; L. M. Moffitt, Triangle Drilling Company, Shreveport; N. H. Wheless, N. H. Wheless Drilling Company, Shreveport.

Texas Division—Walace Hawkins, chairman, Magnolia Petroleum Company, Dallas; A. M. McCorkle, Stanolind Oil and Gas Company, Houston; Charles P. McGaha, Fain & McGaha, Wichita Falls; John R. Suman, Humble Oil & Refining Company, Houston; W. L. Stewart, Westbrook Oil Corporation, Fort Worth.

Kansas-Oklahoma Division—Frank M. Porter, chairman, Fain-Porter Drilling Company, Oklahoma City; Villard Martin, vice-chairman, Tulsa; A. M. Blow, Amerada Petroleum Corporation, Tulsa; E. F. Bullard, Stanolind Oil & Gas Company, Tulsa; W. L. Connelly, Sinclair Prairie Oil Company, Tulsa; C. P. Dimit, Phillips Petroleum Company, Bartlesville, Oklahoma; Rush Greenslade, Gulf Oil Corporation, Tulsa; C. C. Herndon, Skelly Oil Company, Tulsa; John H. Kane, Dover Investment Company, Bartlesville; Clarel B. Mapes, Mid-Continent Oil & Gas Association, Tulsa; H. N. Pardee, The Texas Company, Tulsa; R. B. Roark, Shell Oil Company, Tulsa; O. C. Schorp, The Carter Oil Company, Tulsa; W. R. Wallace, Magnolia Petroleum Company, Oklahoma City.

International Oil Pact Offers Advantages if Properly Implemented*

Industry's basic idea of permissive coordination without compulsion needed if plan is to succeed

By JOSEPH E. POGUE
Vice President, The Chase National Bank of the City of New York

THE recent Anglo-American petroleum agreement signed by representatives of Great Britain and the United States, with its explicit pledge that ratification will be promptly followed by an international oil conference leading to a multilateral oil compact, has aroused wide interest in world oil developments. The Interstate Oil Compact Commission is wise to make the topic of international oil agreements the subject of its consideration at this meeting.

Our government is a federal government—a federation of states. In respect to the laws governing the soil and the subsoil, and petroleum in particular, our states are sovereign. Our states, so to speak, are "nations," and the federal government is a binding and coordinating force. Most other great nations, by contrast, are unitary with sovereignty lodged in the central administration. Because of the similarity of the problems arising from a federation of states and an aggregate of nations, the experience of the United States with respect to oil can be carried over and applied in the international field.

The American petroleum industry is considering an important undertaking in the application of our interstate experience to the international field. These matters touch very closely the American petroleum industry, the state conservation bodies, and the Interstate Oil Compact Commission. Judging from experience in this country, administrative procedures for the coordination of the interests of the state and the industry do not emerge perfected from initial effort, but have to evolve by a process of adaptation.

It is as important to understand the suitability of our American oil experience for application to the international field, the needs for such extension, and the objectives to be sought, as it is to consider the nature of the initial efforts at embodiment. All proposals of course, should receive the closest scrutiny and most careful analysis, to make sure they merit support; and if they do not, ways should be found to alter them into acceptable form. But exclusive preoccupation with the details of articulation may raise issues which will endanger the opportunity for the furtherance of those principles which the American petroleum industry has so effectively sponsored in the United States.

This discussion does not propose to go into a legal exegesis of the proposed Anglo-American Petroleum Agreement. That analysis is the concern of legal experts and another setting. But if we agree on the fundamental needs, the ends to be served, and the means to be employed, then the right document is bound to be forthcoming under the stimulus of effective and constructive discussion.

Why a Pact Is Desirable

At the outset it may be asked: Is an international oil agreement desirable or necessary? And if so, why? The world has got along without one up to the present. Are there changed conditions which make the procedures of the past unworkable? Are there new problems which require solution?

The reasons are many why an international oil agreement is essential to promote the world oil economy of the future. First, oil is destined to play a pivotal role in determining the future standards of living in all nations. Second, oil has been and may again become a very important influence making for peace or discord in future international relations. Third, over the long-term, foreign oil developments may assume increasing importance to the welfare and security of the United States. Fourth, the latest oil resources of the Middle East, formerly little known and fallow, have been converted into a great potential for creating conditions of advancement or disruptions for all interests concerned, including our domestic oil producers. Fifth, the trend toward extreme nationalistic policies in many countries is holding back oil developments so important for expanding economies. And sixth, the nationals of the United States have technology and capital available for the foreign oil development that needs to be encouraged in the interest of world peace, world economic expansion, the welfare of the United States, and the prosperity of the functioning industry itself.

The long-range purpose of an international oil agreement is to facilitate the orderly and efficient development of the world's oil resources, avoiding on the one hand those repressive forces which make for an inadequate supply, and preventing on the other hand the hasty exploitation of rich deposits in such manner as to cause surpluses with their train of wasteful consumption and disinvestments. Such results have been achieved in the United States as a conservation measure to prevent the waste of an irreplaceable resource, and these ends have been brought about by decentralized procedures that are not repressive but permit the effective operation of competitive forces.

A more immediate purpose of an international oil agreement is to adjust the world oil industry to the impacts of the changes brought about by the war. The great oil deposits of the Middle East have undergone more active development, new refineries have been built in many parts of the world, widespread destruction of facilities has taken place, new relationships have developed between industry and government in many countries, and we may face a difficult readjustment period in world reconstruction. Consequently, for our own safety it is necessary to see that these new supplies and the changed pattern of world oil developments do not impinge upon our own economy and reverse the forward trend that has thus far characterized the developments of oil by American nationals both in our own country and in the rest of the world.

Oil is irregularly developed in different parts of the world. Large oil resources are found in some areas and meager supplies are available in others. This uneven pattern is only partly the result of geological conditions, for in many countries national policies have precluded extensive search for oil. Similarly, the consumption of oil varies widely from country to country. Where industrialization is advanced, consumption is large. In other countries the use of oil is small because of low standards of economic productivity. In some countries the consumption is limited by nationalistic policies which place such high tariffs on imports as to deny the benefits of oil to most of their citizens.

The unbalanced development of production and consumption in most countries means that oil must flow in international trade in large volume. The movement, of course, must be from countries with surplus available for export to countries with small natural supplies. These international shipments are likely to increase with expanding industrialization.

Promotes Security, Economy

The interest of the United States in an international oil agreement is that of promoting its national security and its own economy. These objectives involve an ample oil supply, a vigorous search for oil in all parts of the world, and a growing international trade in oil so that all countries can have the benefits brought by increasing oil consumption, with its leverage effects upon transportation and industry. Our country benefits from a peaceful and prosperous world.

Other countries have much the same interest in oil, though in lessened degree because no other country has such a high per capita consumption as our own. Countries with oil resources in excess of domestic needs are interested in world trade in oil, as it affords them an opportunity to export surplus supplies and thus gain revenues and foreign exchange. Countries with large consumption but without sufficient oil resources need ample commercial supplies of oil to maintain and advance their own standards of living.

Private oil companies are interested in an international oil agreement which will reduce the political risks of operating abroad and will avoid setting up controls that may hamper the operation of

* An address delivered before the Interstate Oil Compact Commission at Oklahoma City, October 7, 1944.

TEAMWORK
AMERICA'S
SECRET WEAPON
THESE roughnecks running Youngstown casing illustrate one reason why America is strong. They are working together as a team. The smoother their teamwork, the better job they do, and the better their chances of getting ahead.
For more than forty years Youngstown has been teaming up with American oilmen. Youngstown grew up in the oil fields, has learned how to supply good reliable tubular goods, when, where and how the oil industry needs them.
QUALITY
YOUNGSTOWN
SERVICE
YOUNGSTOWN
THE YOUNGSTOWN SHEET AND TUBE COMPANY
YOUNGSTOWN, OHIO
Manufacturers of
CARBON - ALLOY AND YOLOY STEELS
Ask your distributor for Youngstown
Pipe and Tubular Products - Sheets - Plates - Conduit - Bars - Electrolytic Tin Plate - Coke Tin Plate - Rods - Wire - Nails - Tie Plates and Spikes - Alloy and Yoloy Steels.

proper competitive forces and thus retard development. Our domestic petroleum companies will be benefited by orderly foreign oil operations. The American petroleum industry has displayed a special aptitude for oil discovery and the entire world would be the loser if its competence and facilities are not afforded a favorable setting for wider application. American nationals in particular are equipped with the requisite capital and technology to contribute an invaluable service to world oil expansion, but the full application of this potential requires the expectation of a return on the investment in proportion to the risks assumed. The records show that the rate of return on invested capital in foreign oils operations has averaged only slightly higher than in the United States. The reduction of political risks will open the field to a wider range of oil developments, and make operations feasible for smaller units of capital.

Fortunately, the interests of the United States, of other nations, and of the private oil industry have so much in common and so little in conflict that great headway can be made if these factors are coordinated through an instrumentality of collaboration and continuous consultation.

Confusion of Thought

A criticism is freqeuntly heard that the purpose of an international oil agreement is to create an international oil cartel, with rigid production and sales quotas, following the lines of many so-called inter-governmental commodity agreements. Some believe that an international oil agreement is designed to give a differential advantage to one or more countries at the expense of other countries. Still others look upon such an instrument as a devious means for our government to gain control of the foreign oil operations of our nationals, or even encroach upon the autonomy of the domestic industry. None of these ideas is present in the policy recommendations of the industry nor should they be admitted into any proposal that looks to the support of the American petroleum industry. They are all objectionable and should find no place in the international engagements of our country.

These objections can readily be avoided if a few simple principles, as developed in the experience of the oil industry in the United States, are clearly understood and followed. An international oil agreement should be free from implications of force or compulsion, and its administration should proceed upon a consultative and advisory level. Its findings must be of the highest technical proficiency. Its proposals should be open to voluntary acceptance by operating units, but no restrictions should be imposed upon compliance with such recommendations by our nationals. And inasmuch as governments and industry are joint parties in interest, it is essential for good results that industry be adequately represented.

The actual and potential oil resources of the world are so great that for the calculable future there exists no problem of scarcity or effective monopoly. World oil, however, may present a problem of surplus. How an international agreement can contribute to the balancing of supply and demand has been well expressed by Dr. Herbert Feis, a former economic advisor to the State Department, in these terms: "(A) hard-and-fast international agreement for the regulation of supply should be avoided. A modest and guarded approach will be well advised . . . the method that recommends itself for the international coordination of production is continuous consultation, guided by agreed principles and carried into effect by the informal acceptance of those who control the main sources of supply, under the gaze of governments combined in council."

A comprehensive international oil agreement can best be developed in two stages. This approach was suggested in the report entitled "A Foreign Oil Policy for the United States," prepared by the Foreign Operations Committee and submitted to the Petroleum Administration for War on November 5, 1943. That report was approved in general by the Petroleum Industry War Council on December 9, 1943, and to similar effect was the resolution of the IPAA on December 11, 1943. This document gave a statement of principles that should determine the foreign oil policy of the United States, included a design for an International Oil Compact as an instrument for its effectuation, and specified under a section entitled "Special Cooperation with Great Britain" the following: "A large part of the known oil reserves involved in international trade are owned, controlled, or under concessions held by nationals of the United States and Great Britain. It is desirable, therefore, that the two governments take the lead in achieving an agreement on basic principles consistent with what is outlined above, to guide their activities and the activities of their respective nationals during and after the war."

The Anglo-American Pact

The Anglo-American petroleum agreement recently signed by the representatives of Great Britain and the United States, and now under consideration by the committee on foreign relations of the United States Senate, embodies many of the suggestions made by accredited representatives of the American petroleum industry. This bilateral agreement is a proposed instrument for meeting problems arising in the interval before a broader, multilateral agreement can be negotiated as pledged in the initial understanding. One must therefore look upon the proposed agreement with Great Britain as merely a step toward a broader international agreement open to adherence by all qualifying nations, producers and consumers alike.

The text of the Anglo-American petroleum agreement has been available for several weeks for discussion and criticism. Some differences of opinion have arisen among those who have studied it. Some of the points are well taken; others are the result of too wide a choice of interpretations. There is much to indicate that the ideas previously expressed by industry were carefully considered in its drafting, although some suggestions were not adopted. The document is faulty in its language and should be clarified. There are ambiguities present which need to be resolved and changes that should be made. In particular, it should be clearly specified that the engagements do not invade the rights of our states, that the provisions have merely to do with holdings by American and British nationals abroad, that the findings of the proposed International Petroleum Commission shall be purely advisory, and provisions shall be made for adequate industry representation. Should these and other alterations and clarifications prove acceptable to the Senate, a new document may well emerge that will merit the adherence of the American petroleum industry. My counsel to the International Oil Compact Commission is to promote enabling clarifications, so that its own great pioneering work may be made available for still wider fields of application.

Conclusion

Members of the petroleum industry have initiated the idea of an international oil agreement in full realization of its hazards if employed as an instrument of narrow state policy and of its advantages if properly implemented. The industry's basic idea of permissive coordination without compulsion must prevail if the world is to benefit fully by the potentialities of oil. The first step in an international oil agreement is logically an understanding between Great Britain and the United States, for the nationals of these two countries produce a very large proportion of the world's oil. But such an agreement should be in acceptable form and it should promptly be followed by a broader, multilateral agreement, open to adherence by all peaceful nations, if the instrumentality is to serve a fully useful purpose.

What are the alternatives to an international oil agreement? Chief among them is the possibility of serious political complications arising out of strife among the nationals of those countries chiefly interested in oil. The Middle East looms before our eyes as a potential scene of surprises, of dislocations, and of discord. Our new relations with the Soviet Union present problems for which our past experience does not guide us into solutions. Within our own country one would have to look forward to a revival of efforts by government agencies to direct and control activities which ought to be left to private initiative. In other words, unless international machinery is created for continuous consultation with reference to the problems of oil flowing in international trade, we should be faced with baffling possibilites which all of us would wish to avoid.

On the other hand with careful work on our part, with unity among our own people, and with a clarification of pending proposals, we have now a promising prospect of an early agreement with Great Britain to be followed by a broader agreement of world-wide scope. If these results can be achieved, we may look forward to an orderly development of the world's oil industry which will at once safeguard the world's peace and open the door to our own greater prosperity.

On API Committee

American Petroleum Institute has announced the appointment of Oscar John Dorwin, general counsel of The Texas Company, as a member of the American Petroleum Industries Committee, succeeding Colonel Harry T. Klein.

Dorwin became counsel for the Indian Refining Company at Lawrenceville, Illinois, in 1926 and was chief attorney until 1931, when control passed to The Texas Company. In 1933 he was placed in charge of The Texas Company's Chicago legal offices and in 1934 was transferred to New York. Dorwin became associate general counsel in 1942, and was elected general counsel this year.

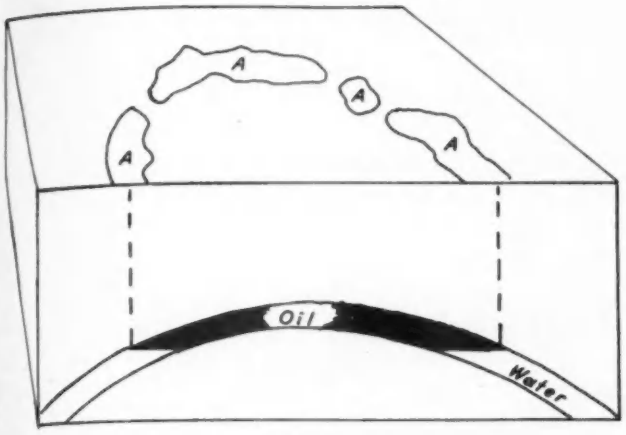


FIGURE 1

Combination block section and map showing cross section oil sand in typical closed anticline with pattern of marginal anomaly at surface. Note that pattern is not necessarily continuous. Marginal anomaly indicated by letter A.

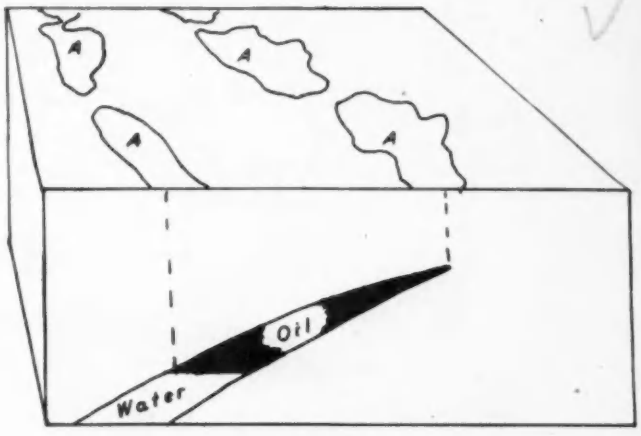


FIGURE 2

Combination block section and map showing cross section of pinched out oil sand forming a stratigraphic trap. Typical marginal anomaly pattern shown at surface designated by letter A.

Geochemistry As Aid to Successful Exploration

By DR. JOHN W. MERRITT
Geologist and Geochemical Engineer

GEOCHEMISTRY, considering its full scope, is an exceedingly broad subject. Within its wide boundaries come the subjects of rock composition, changes in chemical composition of rocks during metamorphism, chemical changes taking place during weathering processes, composition of river, lake and sea waters, chemical deposition of sediments by precipitation out of waters under varied conditions, effect of underground waters on their surrounding rocks and vice versa and endless other chemical phenomena connected with the earth and its parts.

Anticlinal Theory

Geochemistry, as related to petroleum exploration, also is not the narrow subject it is commonly thought to be. A careful study of the geochemistry of petroleum, its ramifications and implications have become a challenge to the imagination and the deductive intelligence of the geologist.

Early in the history of mankind seepages of oil and gas were known. In the beginning oil prospectors were wont to drill in the neighborhood of such seeps. Many such tests proved unsuccessful, however, and a better method was sought. This led to the development of the anticlinal theory of oil and gas accumulation and the era of oil geology began. This was a prosperous era almost from the beginning. The prosperity continued through the period of surface geological mapping and, when this method declined because of the scarcity of surface data and the drilling of the best surface structures, subsurface geology through well records and core drill information came into vogue. When shallower prospects had become scarce, making further subsurface work more costly, geophysics was brought into use, giving the operator the choice between seismographic surveys or the use of gravity or magnetic methods of mapping. However, in spite of the combined use of surface and subsurface geology and all forms of geophysics, the discovery rate in our country continues to decline and the cost of discovery to increase.

Using Hydrocarbons

A few years ago scientists, speculating upon the fact that hydrocarbons known to be present in oil and gas deposits could easily permeate most of the sedimentary rocks of the earth, began to wonder whether such hydrocarbons might be found in measurable quantities above such deposits. They expected that light hydrocarbons would be the most abundant and that they would show the greatest volume above the center of the productive area. They made their first tests by drilling holes into the soil and sealing them long enough to let the gas ("soil air") accumulate in detectable quantities. The air of these holes was sampled and analyzed for the suspected hydrocarbons. The hydrocarbon values obtained were then plotted on their maps at the points from which they were obtained and the density pattern studied. It was early developed to the amazement of the chemists that the density of concentration of the hydrocarbons did not increase from the margin to the center of the productive area, but that the greatest concentration formed a marginal band or halo corresponding to the margin of production. The origin of this peculiar pattern has been difficult for geologists and geochemists to explain and they have brought forth a number of theories, which cannot be discussed here.

In petroleum geochemical studies different geochemists have used various hydrocarbons or combinations of hydrocarbons out of which to build density patterns. They may be classed in three groups: the solids, the liquids and the lighter or gaseous hydrocarbons, with the latter two more commonly used. The method of sampling has changed from "soil air" to direct analysis of the soil itself. Analysis methods also vary with the type of hydrocarbon sought. They are measured as gases volumetrically, as solids or liquids gravimetrically, or by use of mass spectroscope, or by intensity of fluorescence photometrically.

Density Patterns

While the halo pattern was early developed by petroleum geochemists, many now are said to have developed a density pattern that increases to the center of the producing area so that isochem contours may be drawn similar to the contours of a closed anticline. Such a contour pattern is less confusing to the operator who is accustomed to reading structure maps, but other types of geochemical delineation may be as easily understood once their use becomes more common. In any event, whichever type of geochemical map is used, the pattern is of paramount value and, whatever chemical values are used, they must stand out over and above the values of the same substances natural to the soil outside the producing area. It has been argued by geologists that whatever substances are analyzed from oil samples, the natural variations of value from

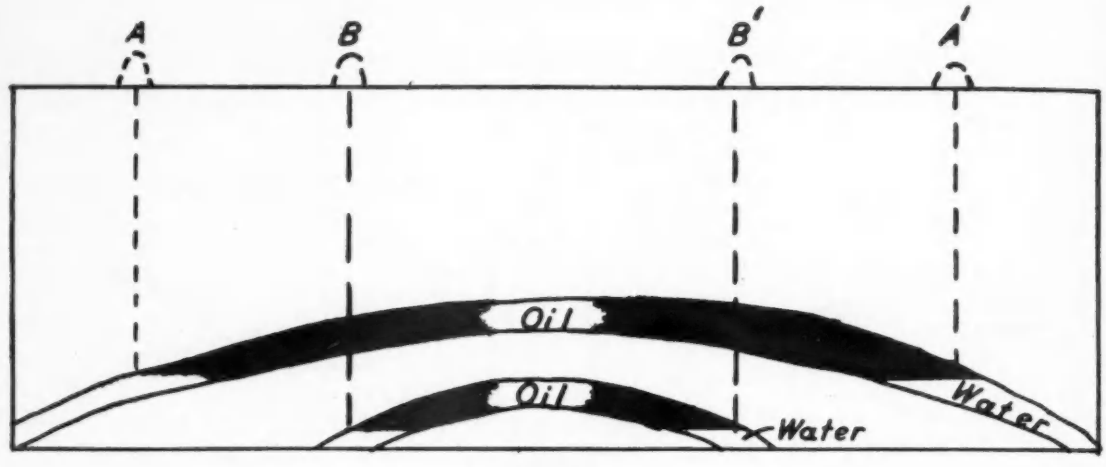


FIGURE 3

Cross section of anticline showing two producing horizons one larger than the other. Marginal anomalies indicated at points A, A' and B, B'. Note overlap of patterns. In surface plan the marginal anomalies will be parallel and concentric.

point to point, regardless of whether oil may be lying beneath, may be plotted and interpreted to mean production or non-production. This may be true to the uninitiated, but to the careful geologist and geochemist such irregularities are ignored and only such patterns as stand out clearly above background irregularities and show such a pattern as to "make sense" to a petroleum geologist are noted as worthy of interest.

To prove that such patterns are in reality related to oil accumulation, however, geochemists have analyzed cuttings from numerous wells drilled in producing areas, at the edges of production, just outside of production, and in non-productive areas. These analyses have been able to develop geochemical patterns in the third dimension showing the relationship of the surface and subsurface concentrations to production strata without a doubt. Surface "background" irregularities disappear as deeper sampling brings about greater values with the approach of the sample to the source.

In the selection of the sample pattern for geochemical mapping much care is necessary, just as in the arrangement and spacing of surface geological points or geohpysical observation points. In earlier times profile patterns were used, either parallel or crossed, or accidental such as lines following roads or trails. This method was used because of its cheapness and simplicity. The dangers of its use are at once apparent, especially in the interpretation of the halo type of pattern. For instance one profile may show a halo "high" crossing it, while in the adjacent profile there may be a halo "high" and an accidental or background "high." In projecting the halo from the first profile to the second, in such a case, which is the geochemist to use?

Grid Pattern

To get away from such difficulties the geochemist turned to the grid pattern. Some of this grid-spacing was made with intervals between points of a quarter mile or a half mile, and, on some occasions a mile. The mile spacing and the half-mile spacing of grid points are, in the opinion of the writer, exceedingly dangerous if the halo system is used, and little less dangerous in case of the other method, for the importance of accidental background "highs" is emphasized. The grid should be close enough to show the background values in detail so the true productive pattern may be brought through it clearly and without chance of misinterpretation. To do this the geochemist uses no wider spacing than 660 feet, or one sample in the middle of each square ten acres, and, in special cases such as the mapping of narrow zones of production or "shoestrings" uses 660 feet between samples longitudinally and 330 feet transversely.

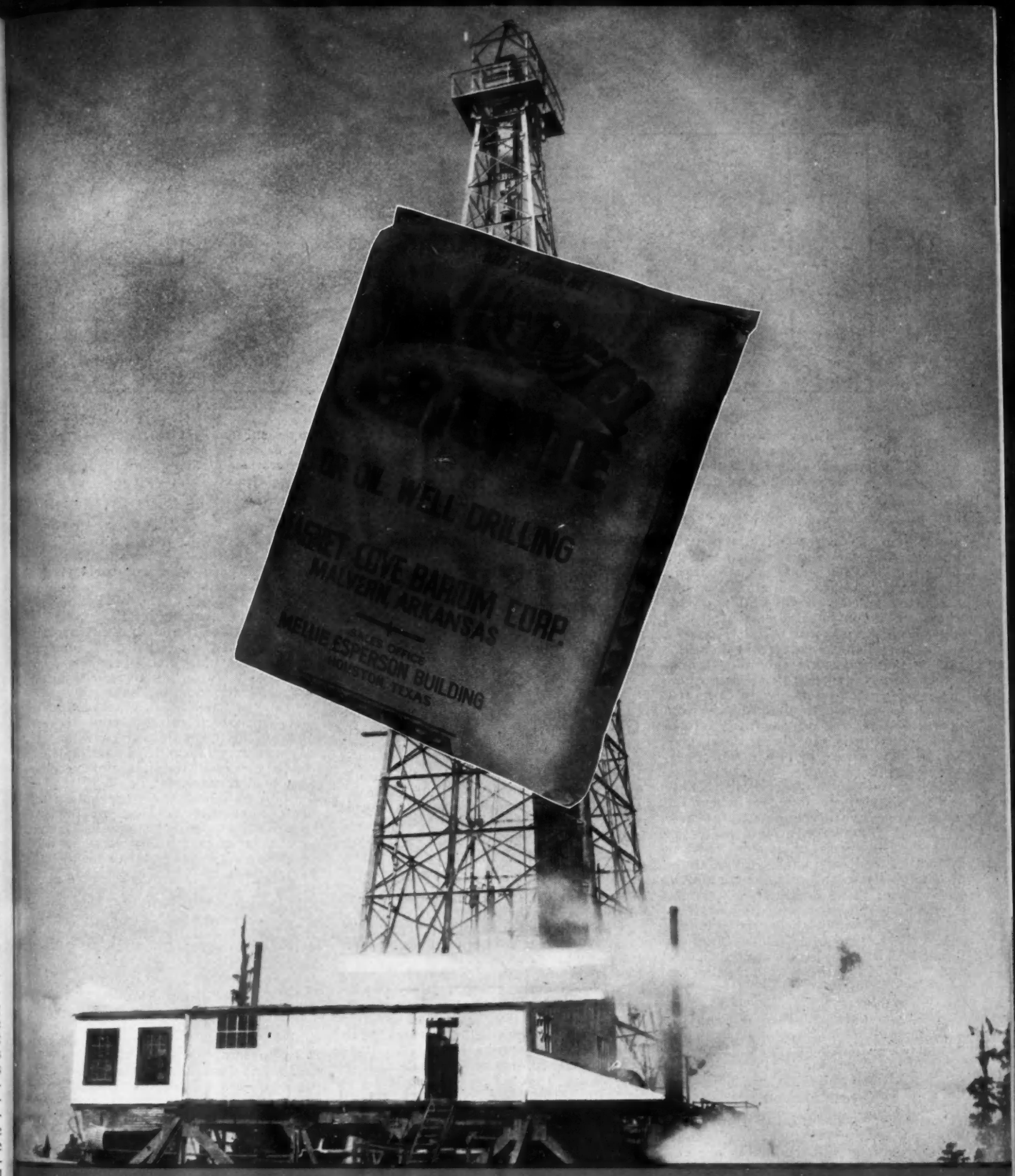
Unjust Criticism

The geochemist has been much criticized because of his frequent inability to repeat values obtained from the same point from two samples taken side by side or from samples taken from the same point at different times. The critics must remember, however, that soil is not a homogeneous substance such as an igneous rock or a liquid. It is not even as regular in chemical composition as a limestone or a sandstone or a shale. It is to be expected, furthermore, that in the use of lighter hydrocarbons there will be loss of value in summer over that in winter, and in hot days over cold days. Wet or dry coil may cause changes as well also as barometric change. Both light and heavy hydrocarbons may be lost or changed through soil bacterial action. Hydrocarbon losses noted in sealed jars of soil in the laboratory may also be accounted for by bacterial action. However, much of the trouble from these variations may be mitigated by sampling and running a project as rapidly as possible and at one time, and by taking lighter hydrocarbon samples from sufficient depth to insure more uniform temperatures. Nevertheless, despite these variations in soils and their contents, the worth while project should have developed above it a geochemical pattern of sufficient strength to "shine through" all such irregularities, just as a man's hand held against a ground glass or a pebble-grained glass is discernible from the other side.

After overcoming the difficulties of pattern discernment brought about by background variables of density, however, the geochemical interpreter is still faced with many problems of interpretation. At this point the geochemist will have need for his utmost geological skill. Inasmuch as geochemistry has not yet developed, a means of determining the depth of the producing horizons from surface information, and since all producing horizons lying superimposed upon one another tend to show their surface patterns, obviously multiple sand areas with multiple production shows up in a surface geochemical map as a complex pattern, allowing for the same confusion in interpretation as would be encountered in trying to differentiate transparent maps of three or four states placed upon one another. If the producing zones were on a structure and the productive margins of all of them were about identical in location, interpretation would, of course be simple. Even in some simple cases of merely two possible zones there may be two equally valid interpretations in the case of marginal anomaly type of work. For instance, a double, concentric pattern might be interpreted as a small producing area lying under or above a larger one; or, on the other hand, it might be interpreted as a band of production around the core of a truncated dome. Without supporting evidence, the only safe recommendation would be to drill between the halo bands and play safe for one sand. In the experience of the writer a fault cutting production will be represented by a high value band lying vertically above the intersection of the fault plane with the pay horizon. Fault patterns, being straight lines, are less difficult to interpret, however, unless the whole is complicated by other irregular conditions. Margins of production in stratigraphic traps are also discernible by geochemical means. The shape of the stratigraphic trap may be anticipated as a check against the pattern itself by a careful study of the local geology. If it is formed by a shore line condition its up-dip or thin-cut edge will conform to the shore line or line of unconformity at the time the sand was laid down. The water edge will conform to the structure after the accumulation.

Seeking Best Pattern

With all the foregoing facts under consideration the interpreter, therefore, must first find a pattern that is outstanding, over and above anything that the background values has to offer. After finding such a pattern, he must



In the U.S.A. during August, 1944, there were 4,011 rigs in operation, as compared with 2,868 in August, 1943—or an increase of approximately 30%.

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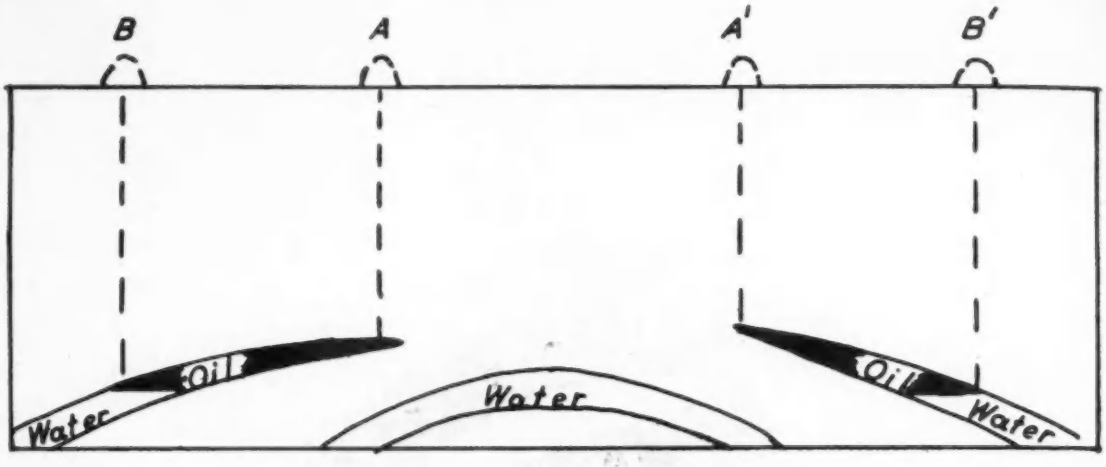

FIGURE 4

Typical cross section of producing anticline having a producing band of oil sand around the structure with the central or top area of the structure devoid of production by erosional cut-out or lack of original deposition. Inner and outer marginal anomalies of this productive band indicated at points A, A' and B, B'. The surface plan of these anomalies will be concentric and parallel as in the case of Fig. 3 but the anomalies will refer to one area of production rather than two.

study it in the light of all the available geology and geophysics to see that his pattern "makes sense" geologically. Having thus assembled all his symptoms, geological, geophysical and geochemical, much as a doctor assembles all available symptoms before diagnosis, the geochemist is ready to evaluate his prospect and make his recommendations.

Geochemistry of petroleum deposition, dealing with the phenomenon of hydrocarbon movement to the surface from deposits of gas and oil, has many related phenomena tied into the general geological picture with it. For instance, certain bacteria are present in the soil which thrive on hydrocarbons. These will be found more abundant where the more dense hydrocarbon patterns may be found. The very ground water in water-bearing horizons appears to vary in mineral content in tests made above production from the mineral content in other places. This condition is thought by many to be related to hydrocarbon movements through these water zones, where the water stands relatively static. Related to these phenomena, also, are such other conditions as variables in earth elasticity. Resulting from the above conditions there is a change in earth conductivity above producing areas as well as some change in speed of sound-wave transmission through the rocks of such areas.

Direct Method

Since the geochemical patterns developed from the analyses of soil above and surrounding oil production are related directly to the presence and location of the oil or gas and are not found above non-productive anticlines, the geochemical method of exploration is a direct method. Because it is a direct method geochemical prospecting has a much wider range of effectiveness than any other well developed system. It becomes apparent that such a method should effectively locate oil traps not related to structure where oil or gas accumulation is made possible by shore line sands, "shoe string" sands or changes in porosity in lime areas. When this new, wide range of usefulness is added to the ability of geochemistry to differentiate between productive and non-productive structures it becomes at once apparent that a proper use of geochemical surveying adds materially to the possibilities of finding new oil reserves where other methods have been exhausted or have become expensive and unprofitable.

Aid, Not Substitute

It is not recommended that the oil operator discard geology or geophysics, but rather it is suggested that its technical staff study geochemistry, learn how to use it, and add it to his other methods in order to improve the results of his exploration efforts. The interpretation of geochemistry properly falls in a large part to the geologist because the geologist, better than anyone else, knows the underground conditions which various geochemical patterns may indicate.

Frequently a geochemical pattern can be interpreted in more than one way. A good example of such interpretation came when the writer was geochemically mapping a certain area where Lower Pennsylvanian sand production was expected and the possibility of Ordovician lime production below it was also anticipated. The map disclosed two well-developed parallel concentric high value marginal anomalies. There was every evidence, both surface and subsurface, of a structure of considerable size and prominence, the high points of which coincided with the center of the area enclosed by these anomalies. It was thought that the larger anomaly marked the outer margin of the Pennsylvanian production and the inner anomaly marked the outer margin of the Ordovician production, because in such cases where both horizons carry production, the Ordovician rocks are more highly folded than the bed of Pennsylvanian sediment and the Ordovician productive area usually covers much less ground.

Accordingly, it was recommended that a test be drilled on the top of the structure in the center of the inner area. When the test was drilled it was found that Pennsylvanian horizons were missing and the Ordovician horizon was considerably higher than anticipated. It was later learned that an old well drilled between the marginal anomalies into the lower Pennsylvanian cored saturation in that horizon but for some reason the well was not completed. The evidence of that well, however, points to the conclusion, probably correct, that the two marginal anomalies marked the inner and outer edges of a Pennsylvanian productive belt missing over the top of the dome because of erosion or lack of original deposition. This incorrect interpretation is only one of the traps into which the geochemist may fall and it is a simple one. Since geochemistry has not yet been able to determine the depth of the production to which the geochemical patterns refer, the problem of the geocehmist becomes increasingly complex as the areas mapped increase in number and in the irregularity of the producing horizons. The experience of the writer, however, leads to the conclusion that geochemical patterns based upon proper sampling both as to area covered and closeness of spacing gives accurate data as to buried oil or gas deposits and that in practically all cases in erroneous interpretation it is due not to the geochemical results obtained but to the inability of the interpreter to determine the meaning of the pattern or patterns disclosed. Geochemical interpretations therefore are a challenge to the best minds in the technical service of oil exploration operators and accurate interpretation offers a reward well worth any effort given by the interpreter.

Cooperation Needed

In the early stages of the development of geophysical exploration methods, many difficulties were encountered in making proper and accurate interpretation. It was not until geophysical operators learned to cooperate with geologists in order to obtain full data for interpretation that geophysics really came into its own as a successful method of operation. Geochemistry now stands in a position occupied by geophysics before complete collaboration was put into effect and it now calls for such collaboration in order to reach the degree of perfection to which it is entitled.

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Another Valuable "How" Article—

How To Increase Life Of Machine Parts

PART 1

By E. N. KEMLER
Professor of Mechanical Engineering, Purdue University

THE necessity for conservation of critical materials for new installations and the frequent lack of such materials for replacement parts requires that careful attention be given the selection of new equipment and the replacement of worn or broken equipment. The following discussion of machine elements has been prepared primarily to explain the fundamental principles of design and operation of such elements and to point out how their life can be increased through proper care or changes in design in case replacement is necessary.

The operator of mechanical equipment can contribute much to increasing its useful life by careful attention to a few important details. The first of these is proper lubrication. Much modern equipment is designed to operate with a minimum of attention from lubrication. When it is lubricated, care should be taken by the operator to follow the manufacturers' recommendations. They are usually prepared in accordance with years of experience and are generally kept as simple as possible. A little more effort and care to use the recommended lubricant and to use it when necessary may result in added life which will in turn release materials for much needed military and industrial uses at this time.

FIGURE 1

Bearing trouble will undoubtedly become more evident when equipment is loaded near or above its recommended rating. The current necessities and often the rulings of governmental agencies may require installation of smaller equipment than we would normally desire to use, In the case of trouble with existing installations, careful attention should be given the design. Much bearing trouble occurs because of the circulation of an insufficient quantity of oil. Increasing the circulation of oil serves to carry away the heat generated by the friction in the bearing. This will result in lower oil temperature which in turn increases its viscosity and therefore its load-carrying capacity. Increases in circulation can frequently be accomplished by proper oil grooving. Care must be exercised in grooving bearings so the grooves will not come under or near the point of support or maximum pressure. The installation of proper cooling or oil circulating equipment may also improve conditions in the case of larger equipment.

In the older type of equipment, wear and failure frequently occurs because of foreign materials getting into the rubbing or bearing surfaces. Sand and dust when mixed with grease or oil makes a good grinding compound. Consequently an open bearing will, even though properly oiled, eventually wear out. Figure 1 shows a case where such foreign material has caused a shaft to wear. Obviously load is not a problem in this case, otherwise the shaft would fail. Figure 2 shows a close-up of another bearing, again showing how the dust-grease compound causes failure. Pumpers, mechanics, foremen and engineers can frequently devise simple means of excluding dust and sand from such bearings with the result that longer life and lower cost will result, and more important, critical materials and labor will be saved.

In the present emergency, cost assumes a role of minor importance as compared with conservation of man power, materials and manufacturing facilities. The man in the field can do much to correct troubles with equipment. The operator of such equipment is depended upon to call attention to conditions which contribute to excessive failures and to equipment or parts giving excessive trouble. The engineer or manufacturer can usually offer suggestions which will result in increased life or elimination of the trouble, once the source has been called to his attention.

The operator can also contribute much by proper care of equipment. He should give careful attention to seeing that the equipment is properly aligned and tightened. Equipment which is not properly lined up generally has loads and stresses put on it which are greatly in excess of the values for which it was designed. For example, the side load required to produce a deflection of 1 inch in a 24-inch, 110-pound I-beam, 20 feet long, fixed at the center is about 4000 pounds. One such misalignment will in this case result in a 4000-pound load being introduced. Such misalignments can introduce large loads which will result in excessive wear or in failure. Equipment which is not kept tight also may introduce shock loads which are much more severe than direct loads. Stresses and bearing pressures which are caused by shock loads may easily be twice as large as those caused by the same magnitude of direct loads resulting from improper adjustment. In the case of pumping equipment, improper counterbalance may also be a factor. This matter will be discussed in a later article.

To better understand how to protect a part from failure or how to increase the life of a part it is necessary to understand how physical failure might occur. The simplest type of failure is that which takes place when a rod or bar is subjected to a direct load. As the load is increased the bar will stretch a small amount until a value called the yield stress is reached at which the rod will stretch rapidly with only a small increase in load. Finally the load reaches a maximum value called the ultimate strength. At this value the bar usually starts to decrease in diameter due to the excessive stretching in some section and the load drops off until failure occurs. Figure 3 shows a typical stress-strain curve for a mild steel. Failure for this type of loading is characterized by a reduction in the section of the rod where failure oc-

FIGURE 2

If protection against wear of joints, collars and casing is to be effective, a Patterson-Ballagh Protector must be used above *each* tool joint. Even *one* unprotected joint (which means a Protector missing or worn below the tool joint diameter) may mean water intrusion five years from today or sooner.

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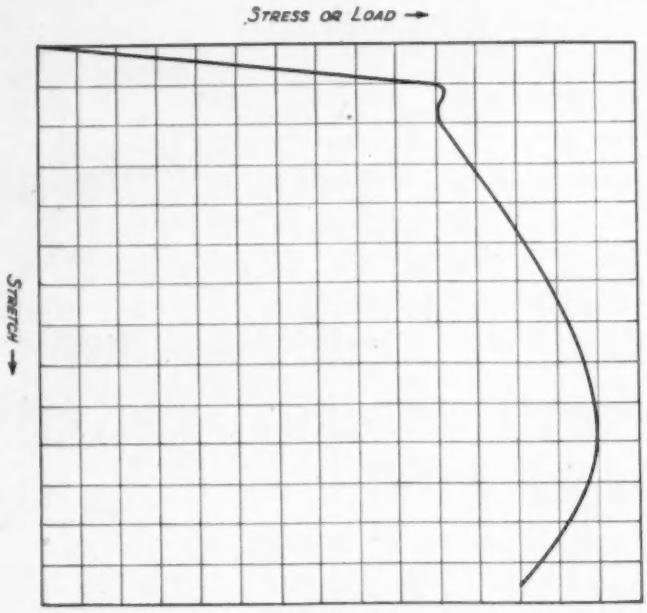

FIGURE 3

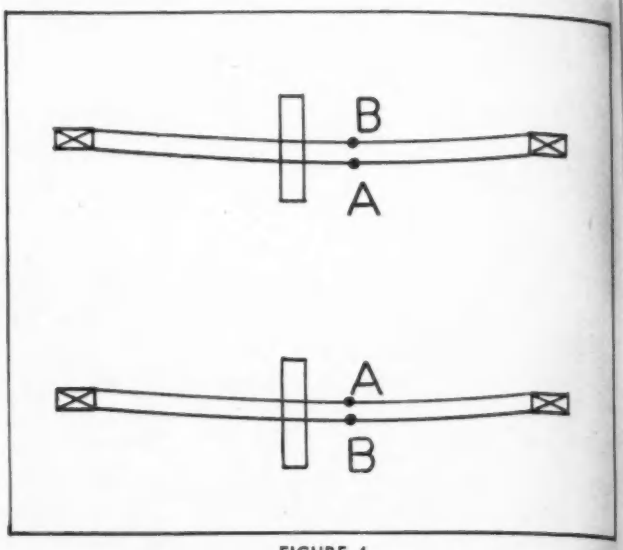

FIGURE 4

curs. The break itself is usually ragged. Figure 1 of the article on "How to Improve Sucker Rod Life"—(THE OIL WEEKLY, August 14, p. 42) showed a typical tensile failure.

It has been found from experience that parts fail in actual practice at loads much less than under direct tensile or equivalent loading when they are subjected to varying loads. Experience and experiment have shown that the load at which such failures will occur depend upon the magnitude of the load and the amount by which it varies. The behavior under variable load is similar but not analogus to the action which takes place when a wire is broken by bending back and forth. If bent in one direction only, or if bent back and forth through a small angle, it will take much longer to break the wire than if it is subjected to a severe bend in both directions.

A rotating shaft subjected to a bending load as indicated in Figure 4 represents the most severe conditions, insofar as fatigue is concerned. When in the position indicated in Figure 4A the point A is in tension and the point B is in compression. When the shaft has turned 180 degrees or ½ a revolution, the point A is now on top and is in compression and point B is in tension (Figure 4-B). This case represents the most severe conditions because the material is first subjected to compression and then tension.

Figure 5 shows a curve of stress vs. cycles at which a material will fail under fatigue. This curve is for the case of complete reversal of stress, that is, a variation from tension to compression. This curve shows that if the stress is kept below a certain minimum value it will never fail from fatigue. In the example shown in Figure 5 the fatigue limit or value below which failure will not occur is 45,000 lb./in.^{2} If the stress is above this value failure will occur. For example, if loaded to a stress of 50,000 lb./in.^{2} and subjected to reversed stress the part would fail at 10^6 or 1,000,000 reversals. In the case of slow speed, machines parts can be loaded above the fatigue limit and may operate for a long time before failure occurs.

Failure due to fatigue is often accelerated by the presence of corrosive agents. A shaft in a pump handling brine, for example, may be subjected to such corrosive action. If the load is steady it may not be of importance. If, however, there is a bending load or variable torque load such as might occur in the shaft, failure may eventually occur. Such a failure is called corrosion fatigue. The amount of corrosion necessary to reduce the fatigue limit is very slight. Water dropping on a rotating shaft may reduce by half the stress or load at which failure may occur. Whenever possible such conditions should be avoided. However, when they occur and cannot be avoided the size of the section must be increased to reduce the stress.

(To be continued)

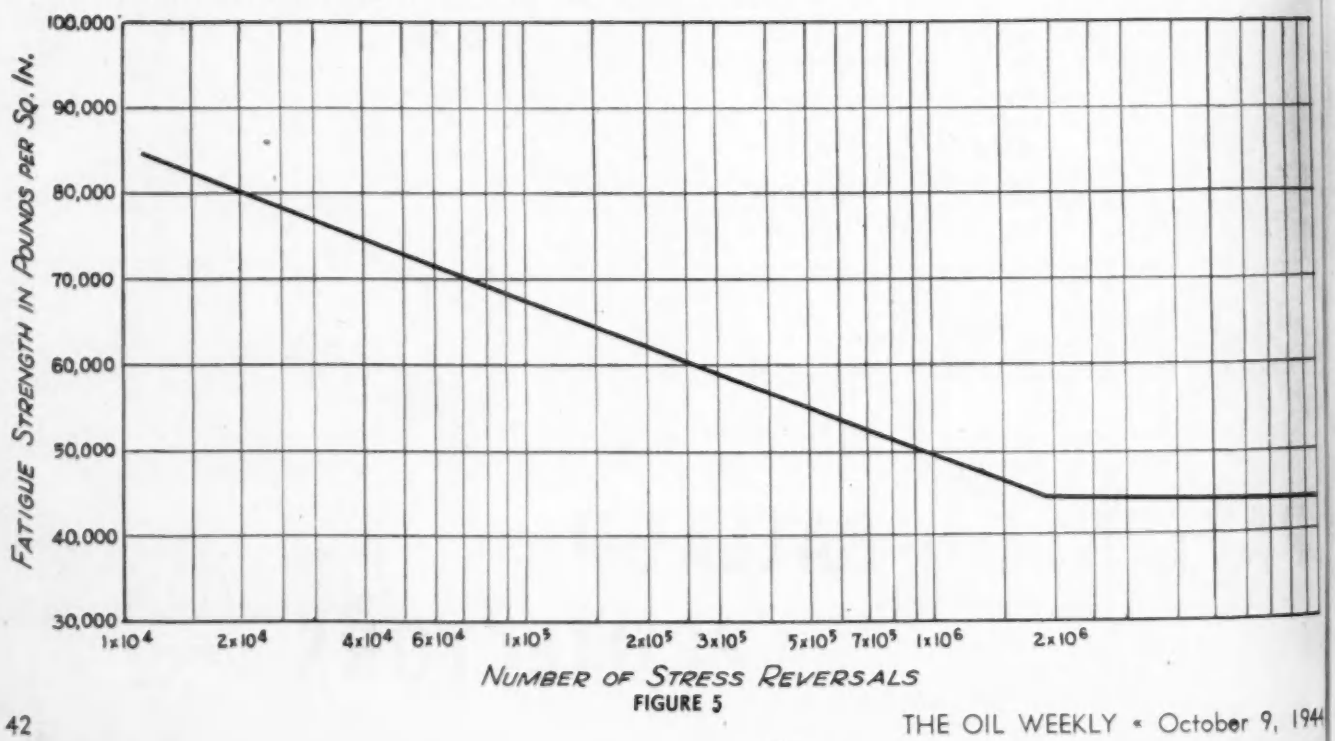

FIGURE 5

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Electrical Well Logging

PART 9

The Two-Electrode Method

Notwithstanding their many limitations, two-electrode curves are quite popular among those who have to interpret Electric Logs. How these curves react on the most typical beds found in bore holes is illustrated in this article

By HUBERT GUYOD
Development Engineer
Halliburton Oil Well Cementing Company
Duncan, Oklahoma

Typical Curves

IT HAS been seen that the values given by the resistance curves of an electric log usually differ from the true resistivity of the formations. This divergence is a function of the resistivity distribution in the ground and also of the electrode configuration used to produce these curves. The logs given by the three-electrode and by the four-electrode arrangements have already been discussed. The present article will deal with the curves given by the two-electrode method.

Strictly speaking, it would have been more logical to discuss the two-electrode method before the three-electrode method. However, because of the particular conditions of application, the analysis of the two-electrode method is more complex than that of the methods discussed previously. It has been thought preferable to deal with the simplest cases first, which explains the order in which these logging methods are being examined.

Basically, a two-electrode curve is obtained with the arrangement shown on Figure 9-1. Two metallic rings C and P acting as electrodes are mounted on an insulated mandrel M suspended in the hole by means of a line comprising two insulated wires. One of the wires W connects electrode C to a constant current generator G whose other terminal is grounded at C′, far from C and P, for instance (but not necessarily) at the surface. The current intensity I flowing in this circuit is measured with an ammeter J. The second wire W′ connects electrode P to a voltmeter U whose other terminal is grounded at P′, far from C and P, for instance at the surface. The system comprises, therefore, the four electrodes C, C′, P, P′, but only two of them, C and P, are effective in giving the log its characteristic features; hence the name, "two-electrode method."

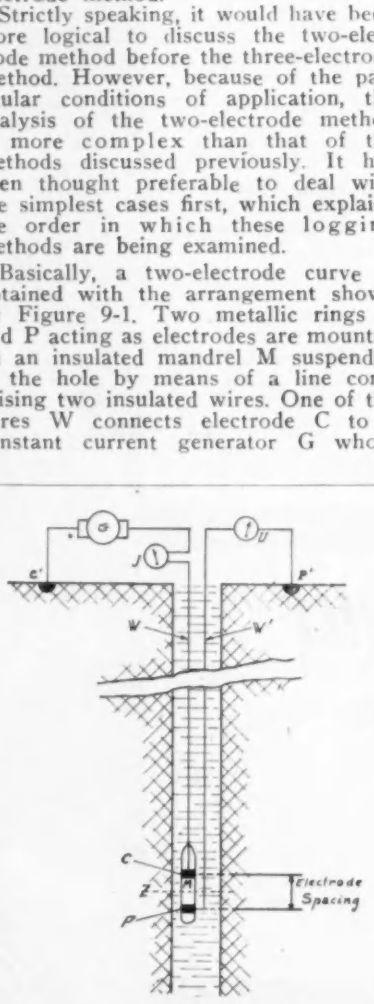

FIGURE 9-1
Electrode and circuit arrangement for the two-electrode method.

Electrode Spacing. As there are only two effective electrodes, there can be no ambiguity when referring to the length of the electrode spacing; this spacing equals the distance CP. Regarding the plotting of the apparent resistivity, it has been shown in Part 4 of the series, that this should be done at point Z, mid-point between electrodes C and P.

Apparent Resistivity. The expression giving the apparent resistivity ρ' obtained by a two-electrode arrangement has been derived in a previous article (Part 4). It is rewritten here as equation (9-1) for convenience.

$$\rho' = \frac{4\pi V}{I} \times CP \qquad (9\text{-}1)$$

In this formula, I is the current flowing in the ground between current electrodes C and C′, and V is the potential difference between potential electrodes P and P′. If I is expressed in amperes, V in volts, and the distance CP in meters, then the apparent resistivity is given in ohm-meters.

If the influence of the bore hole is neglected, ρ' can easily be calculated, in the case of parallel stratification, by the method discussed previously in Part 5, provided the true resistivity of each formation is known. The converse is, unfortunately, not true, namely, from a knowledge of ρ' (that is to say, from an actual electric log), it is not possible, with mathematical means only, to calculate the true resistivity of a given bed even in the simplest cases. An indirect method for determining approximately this resistivity is, however, applicable in many cases, in particular when the object bed is homogeneous and comprised in a thick and homogeneous formation. This method is similar to that described previously for the determination of the true resistivity of thin resistant beds by the three-electrode method. Basically it consists in securing experimental and/or calculated information for a wide range of resistivity distributions and bed thickness. These data are then used for establishing a family of curves from which the true resistivity can be computed. A variant of this method consists in establishing a chart from which a correction factor can be determined. This latter procedure will be used for the determination of resistivities from two-electrode curves.

Experimental and theoretical data on the two-electrode method will be analyzed in some detail in the present article. The use of this information for resistivity determinations will be the subject of a subsequent article.

Typical Curves

Figures 9-2 through 9-8, 9-10 through 9-15, and 9-18 through 9-21 represent the apparent resistivity curves paralleling most of those established previously for the three-electrode arrangement. In addition to permitting a

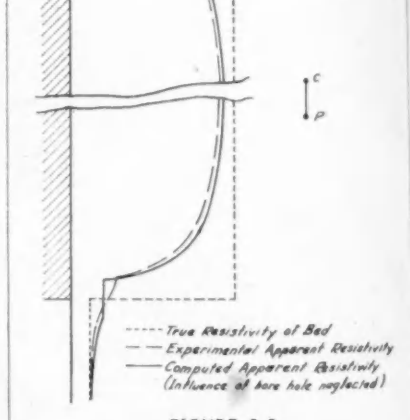

FIGURE 9-2
Two-electrode curve in a very thick bed nine times more resistant than the surrounding formation.

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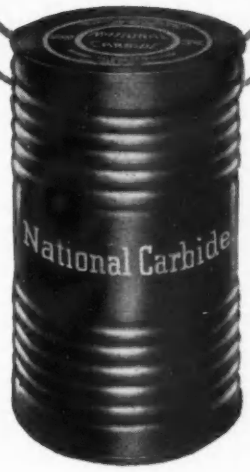

You can depend on National Carbide—the famous "carbide in the red drum". More than a quarter century of widespread use has established the economy, uniformity and productivity of this quality carbide.

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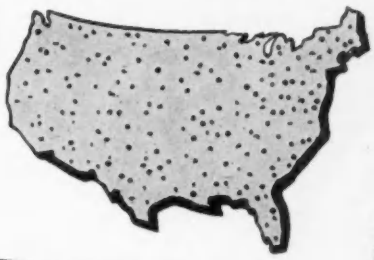

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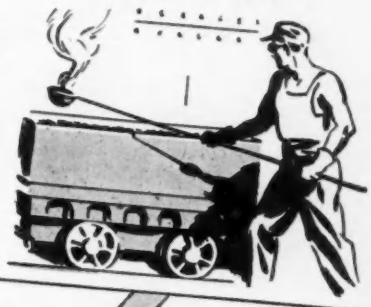

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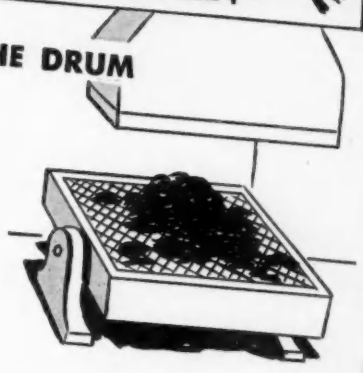

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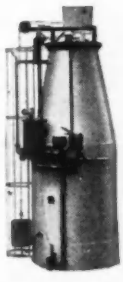

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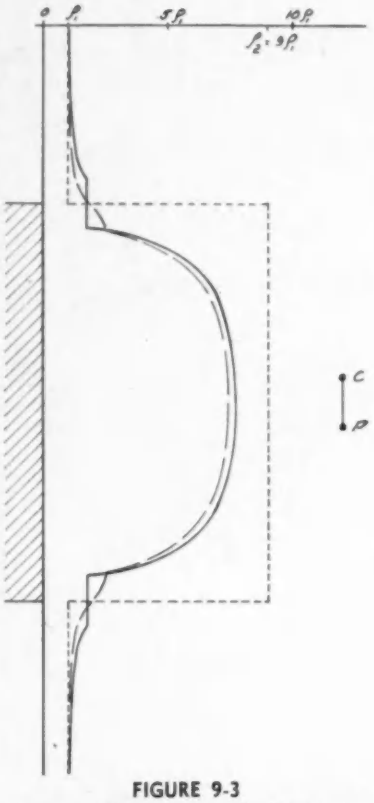


FIGURE 9-3
Two-electrode curve in a thick bed nine times more resistant than the surrounding formation.

good analysis of the two-electrode method, this procedure will facilitate the comparison between the curves given by the two logging systems. In each of these figures, the section represented is assumed to consist of a single bed situated in an extremely thick formation. For the sake of simplicity, the bed will be called "sand" and the surrounding formation "shales," throughout this discussion, although they may be, of course, of a different lithological nature.

The solid lines of the figures are calculated curves, the influence of the bore hole and of the fluid it contains

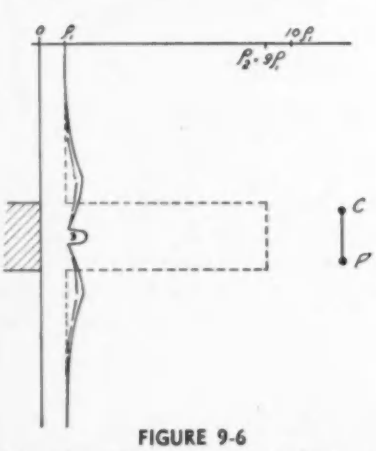


FIGURE 9-6
Two-electrode curve in a bed whose thickness is 1.33 times the electrode spacing and whose resistance is nine times that of the surrounding formation.

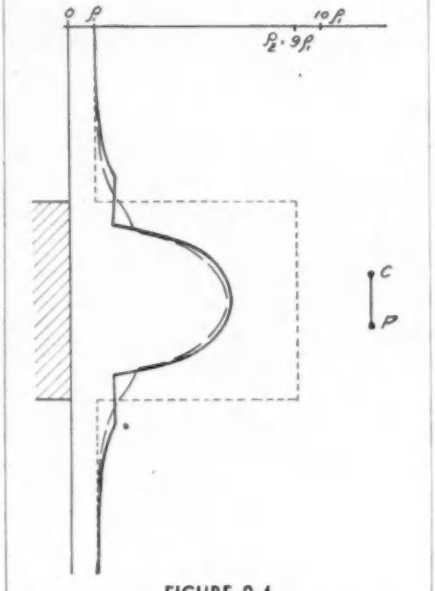


FIGURE 9-4
Two-electrode curve in a bed whose thickness is four times the electrode spacing and whose resistance is nine times that of the surrounding formation.

being neglected. The method used for this computation has been described in Part 5 of the series. As no analytical method taking into account the presence of the bore hole is available, the influence of this factor has been investigated by carrying out measurements on scale models. The results are represented by the dash line curves of the figures. Both computed and experimental curves were obtained, subject to the following conditions:

1. The sand and the shales are homogeneous and isotropic.

2. The formations are not invaded by foreign fluids.

3. The electrode line CP is perpendicular to the stratification.

The validity of these assumptions which has been discussed in a previous article dealing with the three-electrode method (Part 6), applies also to the two-electrode method. Therefore it will not be repeated here.

The experimental curves were established with a mud resistivity ρ_m equal

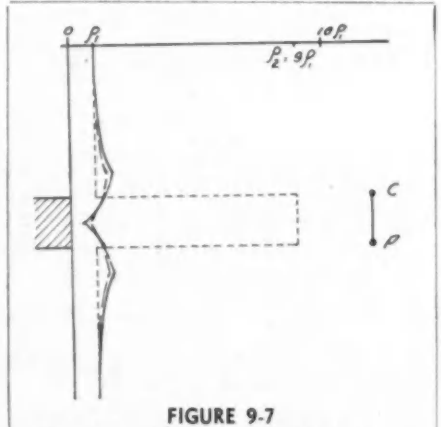


FIGURE 9-7
Two-electrode curve in a bed of critical thickness nine times more resistant than the surrounding formation.

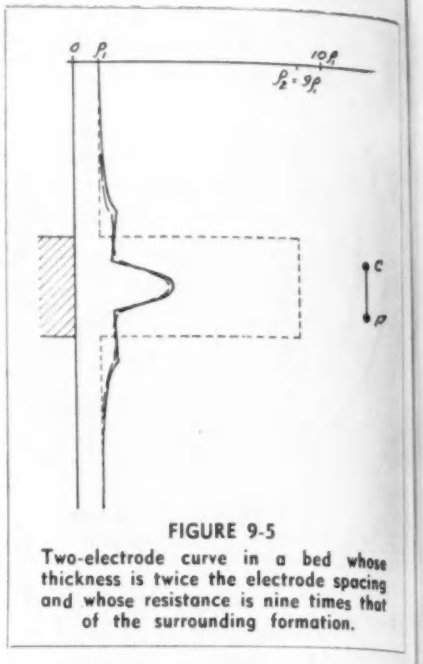


FIGURE 9-5
Two-electrode curve in a bed whose thickness is twice the electrode spacing and whose resistance is nine times that of the surrounding formation.

to ρ_1, the resistivity of the shales, and with a bore hole diameter equal to 2½ times the electrode spacing. As usual, the dotted lines of the figures represent the true resistivity of the beds: ρ_1 in shales and ρ_2 in the sand.

Resistant Beds

Figures 9-2 to 9-8 represent the curves obtained on a sand of resistivity nine times greater than the resistivity of the surrounding shales, (namely, $\frac{\rho_2}{\rho_1} = 9$) and for the relative trickness of the sand $\left(\text{namely, the ratio } \frac{\text{bed thickness}}{\text{spacing}}\right)$ equal to ∞, 8, 4, 2, 1.33, 1, 0.33 respectively. The shales are assumed to be extremely thick on each side of the sand.

Thick Beds. In the following discussion, beds whose thickness is larger than the spacing length will be designated as thick beds, whereas those which are thinner than the spacing will be called thin beds. This is the same definition as that used when discussing the three-electrode curves. It will be seen that this classification is very convenient when the two-electrode method is concerned.

An inspection of Figures 9-2 to 9-6 reveals that the response of a two-elec-

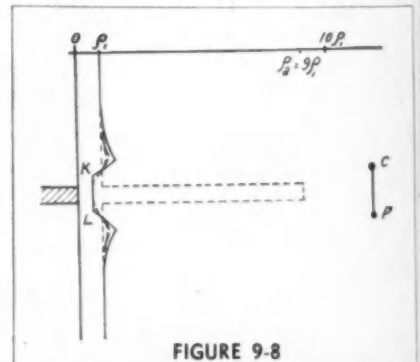
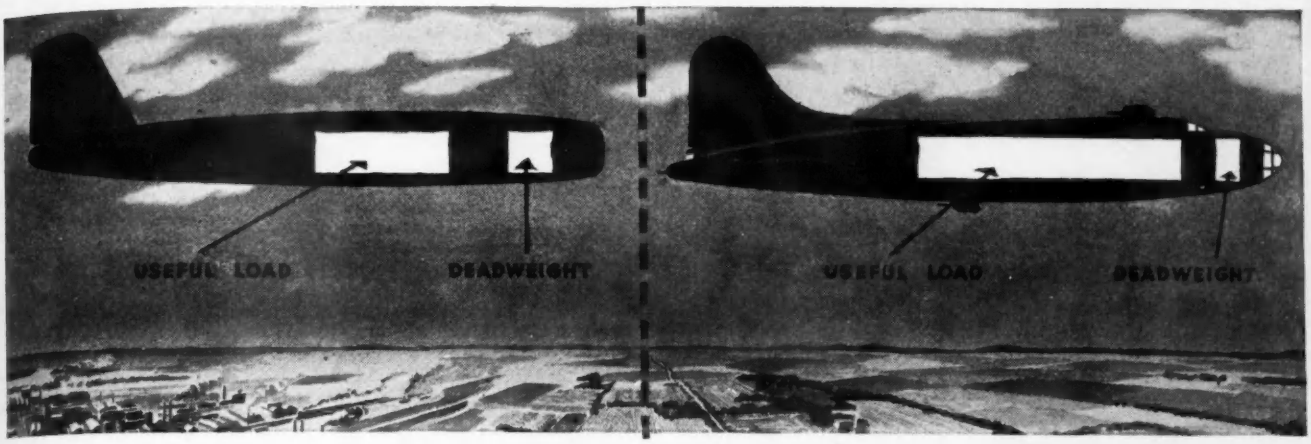


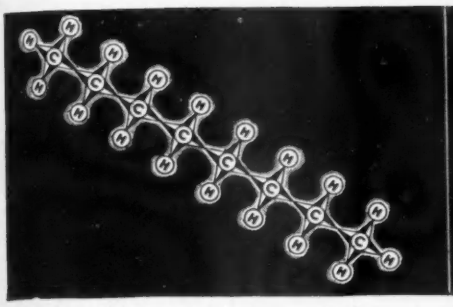
FIGURE 9-8
Two-electrode curve in a thin bed nine times more resistant than the surrounding formation.

DIAGRAM FOR VICTORY

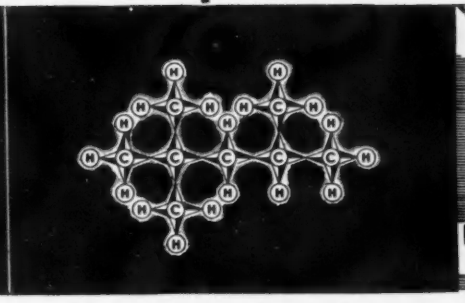


1934 **This represents the ratio of Useful Load to Deadweight** in a bomber of the early 30's. Then, in 1934, a powerful ally—a new fuel—came to the aid of Useful Load, and dealt the knockout to Deadweight. Shell Research supplied "the makin's" of the first 100 octane aviation fuel ever produced in a commercial quantity.

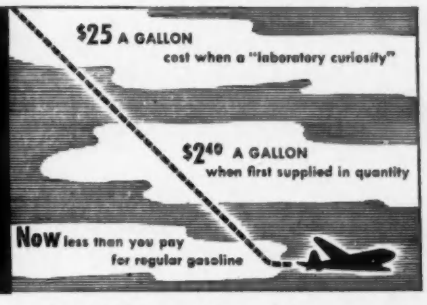
1944 **And this, representing today's ratio of Useful Load to Deadweight,** is America's Diagram for Victory. Freed from the limitations of less productive fuel-weight and engine-weight, designers have produced bombers and fighters whose flying range, speed, and "ceiling" make it possible to carry the war to the Enemy.



The Chemist uses symbols meaningless to the average man. To a chemist, the mixture of hydrocarbons in regular automobile gasoline might look like the above.



But when Iso-octane was discovered—a new, rare combination of the atoms found in petroleum—in the symbolic language of the chemist it had this much more elaborate form.


$25 A GALLON
cost when a "laboratory curiosity"
$2.40 A GALLON
when first supplied in quantity
Now less than you pay
for regular gasoline

The first "laboratory" cost of Iso-octane was about $25 per gal. Then in 1934—Shell was able to supply 1000 gallons of Iso-octane—to make 100 octane Aviation Fuel—at $2.40 per gal.

This year marks the close of an historic Decade in the Age of Flight.

It began when the U. S. Army Air Corps was provided with 1000 gallons of Iso-octane, to make the first commercial supply of 100 octane aviation fuel.

You can judge the importance of that event in 1934 by our present fighting advantages which grew from it.

Even at the 1934 price of $2.40 a gallon, the Army got excellent value, for Shell scientists responded to the Government's request for 95 octane with a fuel 5 octane points better than hoped for—establishing the 100 octane standard which endures today.

But at $2.40 a gallon, even our rich country could scarcely sustain the burden of the present monthly output of over 630,000,000 gallons of this fuel.

In the years of urgent need—the free American oil industry, working as a team, is making what captive Enemy Industry can't make.

Shell is proud to be part of the American team which is producing over 20 millions of gallons of 100 octane aviation fuel, every day.

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4. **Its Shareholders**—through a fair return on their investment.

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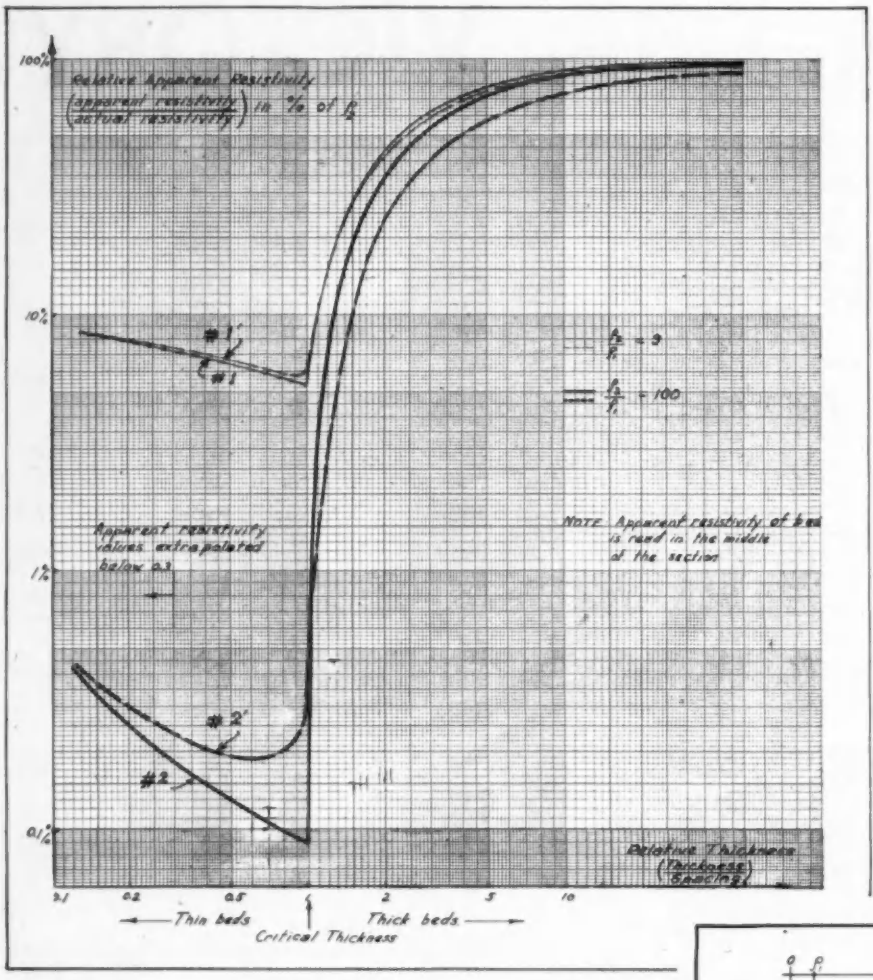

FIGURE 9-9

Apparent resistivity of a bed as a function of its thickness (two-electrode method).

trode arrangement on a thick resistant bed can be summarized as follows.

1. The top and bottom contacts of the beds are sharply defined, although they are not positioned exactly at their correct depth (see Figure 9-3 for example). The top boundary is too low, and the bottom one too high, the difference in depth being the same for both boundaries and equal to exactly one-half the electrode spacing CP. The apparent thickness of a resistant bed is therefore equal to the true thickness minus the distance CP. In other words, to obtain the correct thickness of a thick resistant bed from an actual log, it is necessary to add the length of the electrode spacing to the apparent thickness measured on the log.

Give Indefinite Picture

The preceding remarks do not apply to beds whose relative thickness is slightly greater than unity (Figure 9-6). Such beds give a very indefinite and unsatisfactory picture, and the preceding rule for computing their thickness does not apply. There is not simple method for computing exactly the thickness of these beds from the two-electrode curve.

2. The section of the curve corresponding to the sand is as distorted as the parallel three-electrode log, however, it is symmetrical with respect to the center of the bed, which gives the graph a better appearance. Because of this symmetry, the maximum apparent resistivity of a thick bed which is reasonably homogeneous will always be at the center of the section. It is therefore logical to consider this particular value, rather than any other one, when speaking of the apparent resistivity of a bed. This will be done in the following discussion, unless otherwise specified.

For Thick Bed

3. If the bed is extremely thick (Figure 9-2), the apparent resistivity given by the computed curve (bore hole neglected) reaches the true resistivity in the center of the section. However, if the presence of a conducting drilling fluid is taken into account, (experimental curves) it is likely that the apparent resistivity does not reach this value (experimental curve of Figure 9-2 was obtained by extrapolation, as measurements on extremely thick beds was not possible). For thinner beds, the apparent resistivity nearly equals the true resistivity when the relative thickness is greater than 20, even when the bore fluid is taken into account (unless it is of extremely high conductivity). For still thinner beds (down to eight times the spacing) the apparent resistivity decreases slightly, but the error remains less than 15 percent (see Figure 9-3). Finally, when the relative thickness decreases from this value of 8, down to unity, the apparent resistivity decreases rapidly to a value less than that obtained in shales, as can be seen on Figures 9-4 to 9-7.

Thin Beds. If the relative thickness is

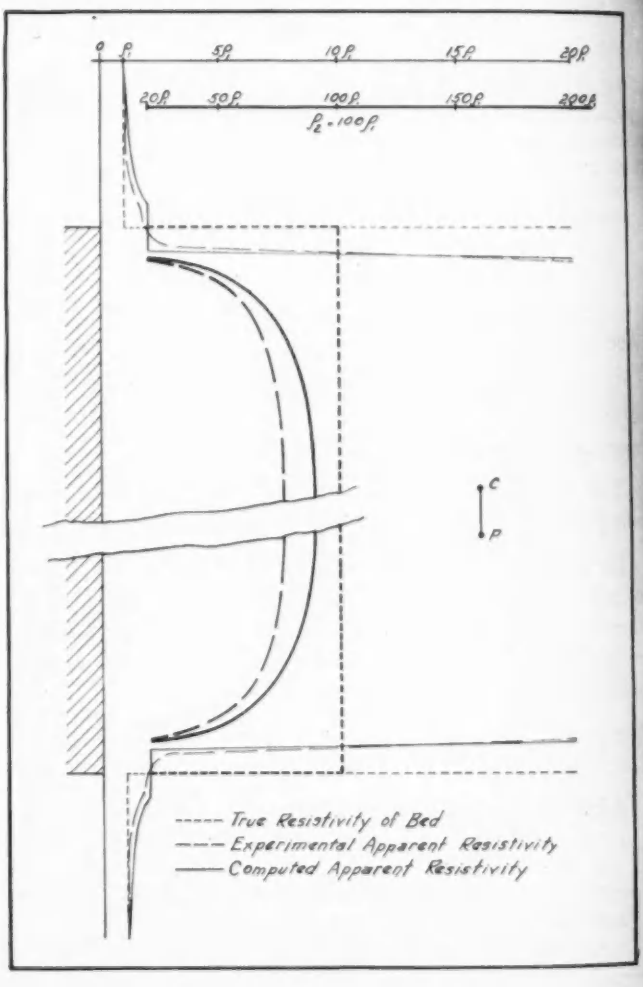

FIGURE 9-10

Two-electrode curve in a very thick bed one hundred times more resistant than the surrounding formation.

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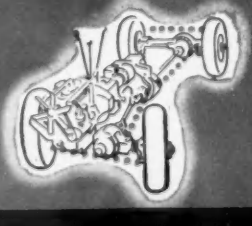

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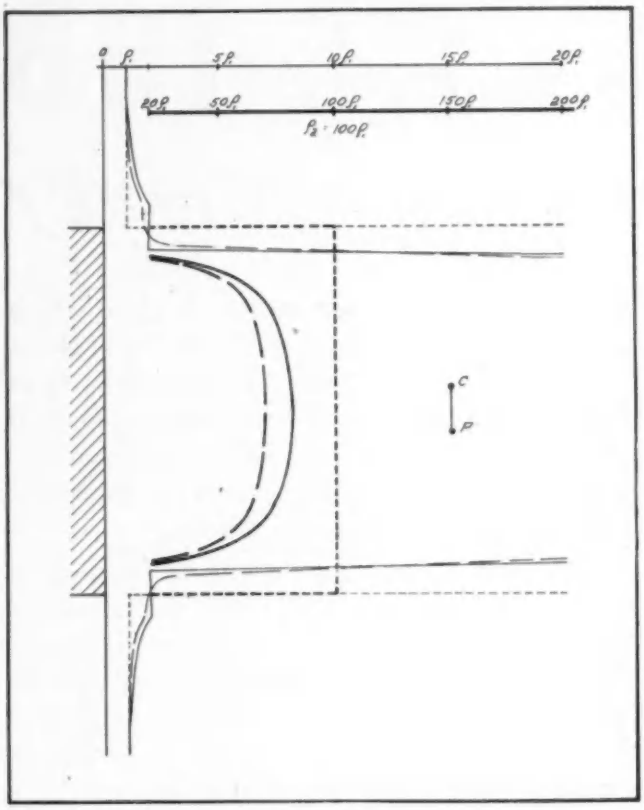

FIGURE 9-11
Two-electrode curve in a thick bed one hundred times more resistant than the surrounding formation.

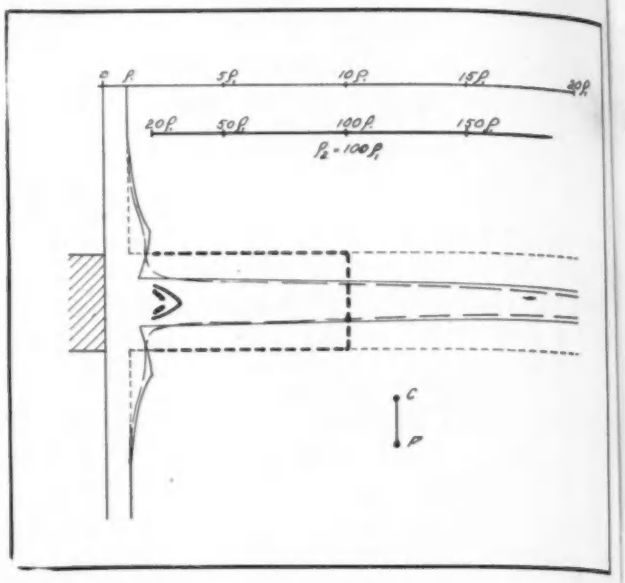

FIGURE 9-12 (Above)
Two-electrode curve in a bed whose thickness is twice the electrode spacing and whose resistance is one hundred times that of the surrounding formation.

further decreased (Figure 9-8), the apparent resistivity starts increasing very slowly, but remains, however, less than ρ_1, the resistivity of shales. On very thin beds, the apparent resistivity equals approximately ρ_1. Such beds cannot, therefore, be picked on a two-electrode log, regardless of their true resistivity.

The height of the section KL of the curve (see Figure 9-8) obtained on thin resistant beds can, theoretically, be used to determine the resistivity of thin beds. This method is, however, very inaccurate in practice and it will not be discussed here. When the resistivity of a thin bed is desired, better accuracy is obtained by using one of the other curves available on the electric log. If the electrode spacings and configurations used for the various curves of an electric log are adequately selected, there will always be one of them which gives data that can be used for quantitative determinations.

Critical Thickness

It can be seen from the preceding discussion that when the bed thickness varies from large values to very small ones, the apparent resistivity passes through a minimum, this minimum being obtained when the bed thickness equals approximately the electrode spacing. This particular bed thickness is therefore called the "critical thickness," as is done when a three-electrode arrangement is used. Sometimes this critical condition is referred to in terms of "critical spacing," instead of "critical thickness." This phraseology is not very accurate because the spacing is usually kept constant during logging operations, whereas the thickness of the various beds to be logged varies continually. If, however, a set of measurements with various spacings were made on a single bed, then one would be entitled to speak of "critical spacing" when referring to the spacing which is equal to the bed thickness. These two expressions will be used in later discussions, and it is well to understand clearly their meaning.

Although two-electrode curves and three-electrode curves are all critical when the bed thickness equals the spacing length, there is an important difference between the critical condition found in each of the two logging systems. Whereas the apparent resistivity of thin resistant beds is reasonably high (several times larger than ρ_1) when the three-electrode method is used, this value is always extremely low (less than the resistivity ρ_1 of the surrounding formation) in the case of two-electrode curves.

In order to illustrate the critical condition observed with the two-electrode method, the apparent resistivity of the resistant beds of the preceding figures has been plotted on Figure 9-9 in terms of relative thickness. Curves 1 and 1′ refer to the computed values (bore hole neglected) and experimental values (influence of the bore hole considered), respectively. These curves show that for a bed thickness slightly greater than the spacing length, there is an extremely rapid change in apparent resistivity. They also show the important fact that the apparent resistivity of resistant beds is always less than the true resistivity. This is different from the result given by three-electrode curves, for which the apparent resistivity is often larger than the true

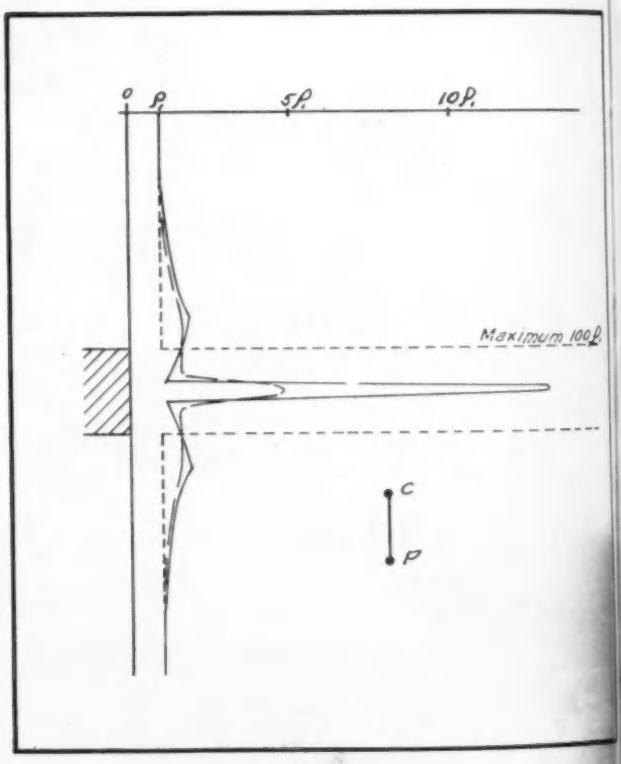

FIGURE 9-13
Two-electrode curve in a bed whose thickness is 1.33 times the electrode spacing and whose resistance is one hundred times that of the surrounding formation.

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resistivity in the bottom section of thick resistant beds.

Highly Resistant Beds

Figures 9-10 to 9-15 represent the curves obtained on a bed one hundred times more resistant than the surrounding formations $\frac{\rho_2}{\rho_1} = 100$, and for relative thickness ∞, 8, 2, 1, 0.33, respectively. To allow better comparison between this set of curves and that discussed previously the same ohm scales have been used. However, where the ohm values were too high, it has been necessary to use, in addition, a more compressed scale, as is done on actual electric logs.

By comparing the curves of Figure 9-10 through 9-15 to those of Figures 9-2 through 9-8 it can be seen that the remarks made previously for a bed of relative resistivity 9 apply, in general, to beds which are much more resistant. There are two differences, however, between these two sets of curves:

1. The apparent resistivity of highly resistant beds is relatively smaller than that of moderately resistant ones, all other factors remaining the same. For instance, for a relative thickness of 8, the maximum apparent resistivity equals 82 percent of ρ_2 when the relative resistivity is 100, whereas it equals 88 percent of ρ_2 when the relative resistivity is 9. These figures refer to the case where the influence of the bore fluid is neglected. When the influence of the drilling mud is taken into account, the corresponding figures are approximately 70 and 85 percent, respectively. These figures show that a mud of normal conductivity affects highly resistant beds to a greater degree than moderately resistant ones. If spacings much larger than 2½ times the hole diameter were used, as was done when the other logging methods were discussed, the influence of the mud would be much less, and the apparent resistivity of thick beds would be closer to the true resistivity value.

2. In thin beds (Figure 9-14 and 9-15) the apparent resistivity measured at the center of the section is much lower for highly resistant beds than for less resistant ones. For extremely resistant sands this apparent resistivity drops almost to zero. This surprising result is due to the fact that when logging thin resistant beds, the potential electrode P is electrically screened from the current electrode C by the resistant material, as shown by Figure 9-16. With very resistant beds this screening effect is quite large, and the potential V at point P is approximately the same as if there were no current electrode; its value, therefore, will be almost zero, and the apparent resistivity ρ', which is proportional to V, as shown by equation 9-1, will also be close to zero.

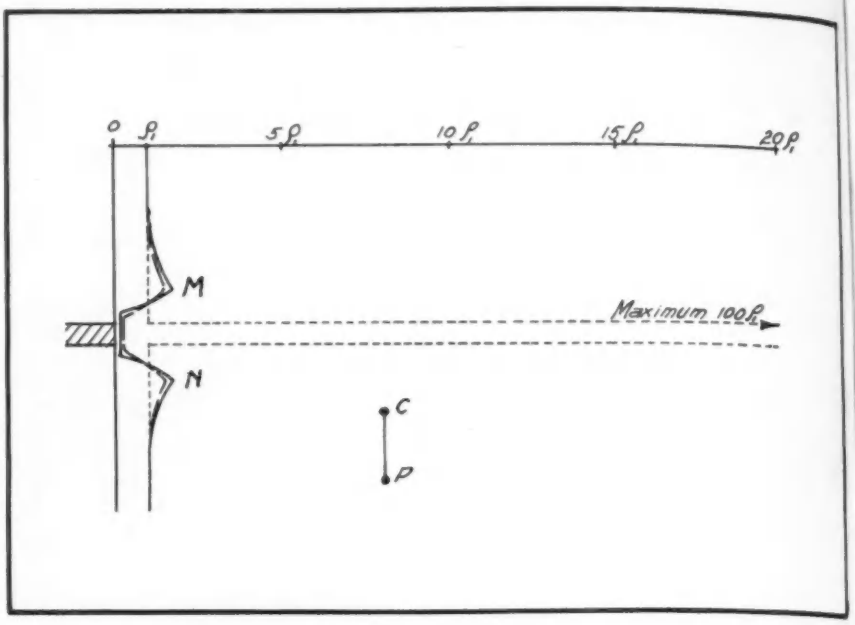


FIGURE 9-15

Two-electrode curve in a thin bed one hundred times more resistant than the surrounding formation.

The preceding discussion regarding highly resistant beds is summarized on Figure 9-9 by curves 2 and 2′ (computed data and experimental data, respectively) which gives the changes in apparent resistivity in terms of relative thickness for beds having a relative resistivity of 100.

From the figures discussed previously it can be seen that, near the sand boundaries, the apparent resistivity in shales is slightly greater than the true resistivity. This relatively high value is found on a short section situated immediately above the sand and on another section situated immediately below it. The extension of these sections is approximately equal to the spacing. This distortion is little noticeable on the logs when short electrode spacings (one or two feet) are used. It is more obvious on thin beds than on thick ones, because its relative extension (compared to the bed thickness) is much greater. Its absolute magnitude is, however, approximately constant regardless of the bed thickness. This distortion can be taken advantage of to determine the thickness of thin resistant beds by observing that the distance MN between the two small maxima M and N (see Figure 9-15) is equal to the bed thickness plus the electrode spacing CP. The thickness of a thin resistant bed is therefore equal to the distance MN minus the spacing length.

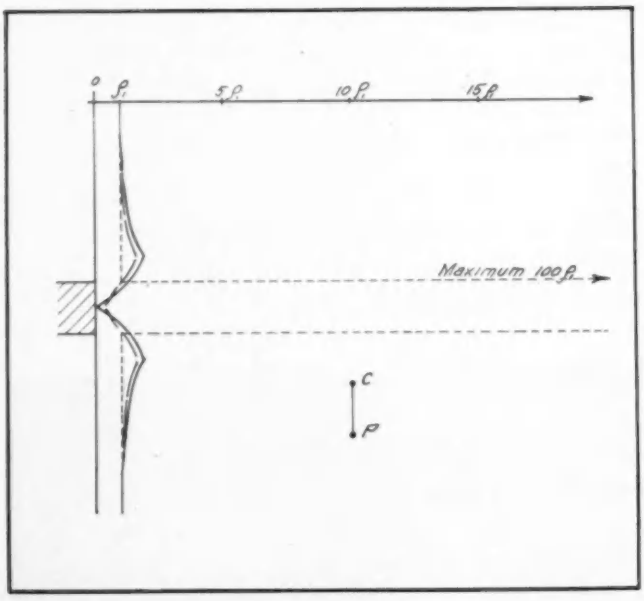


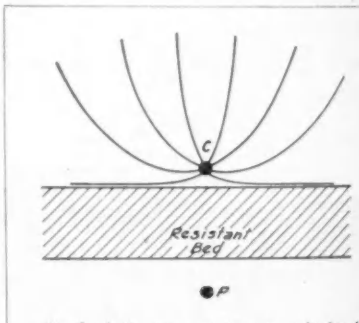
FIGURE 9-14

Two-electrode curve in a bed of critical thickness one hundred times more resistant than the surrounding formation.

Actual Logs

The curves discussed in the preceding section have been established with the assumptions that the formations were homogeneous and isotropic, and that the stratification was horizontal. As these conditions are almost never fulfilled in practice, it is necessary to investigate briefly the influence of these factors on two-electrode curves.

If the sand is not homogeneous, the actual curves will evidently be different



Most of the current leaving electrode C is reflected upward by the resistant bed and practically no current reaches electrode P

FIGURE 9-16

Explanation of the abnormally low apparent resistivity obtained on thin resistant beds by the two-electrode method.

SPECIFICATIONS . . . STERLING VIKING DIESEL

Supercharged and Unsupercharged—6 and 8 cylinder

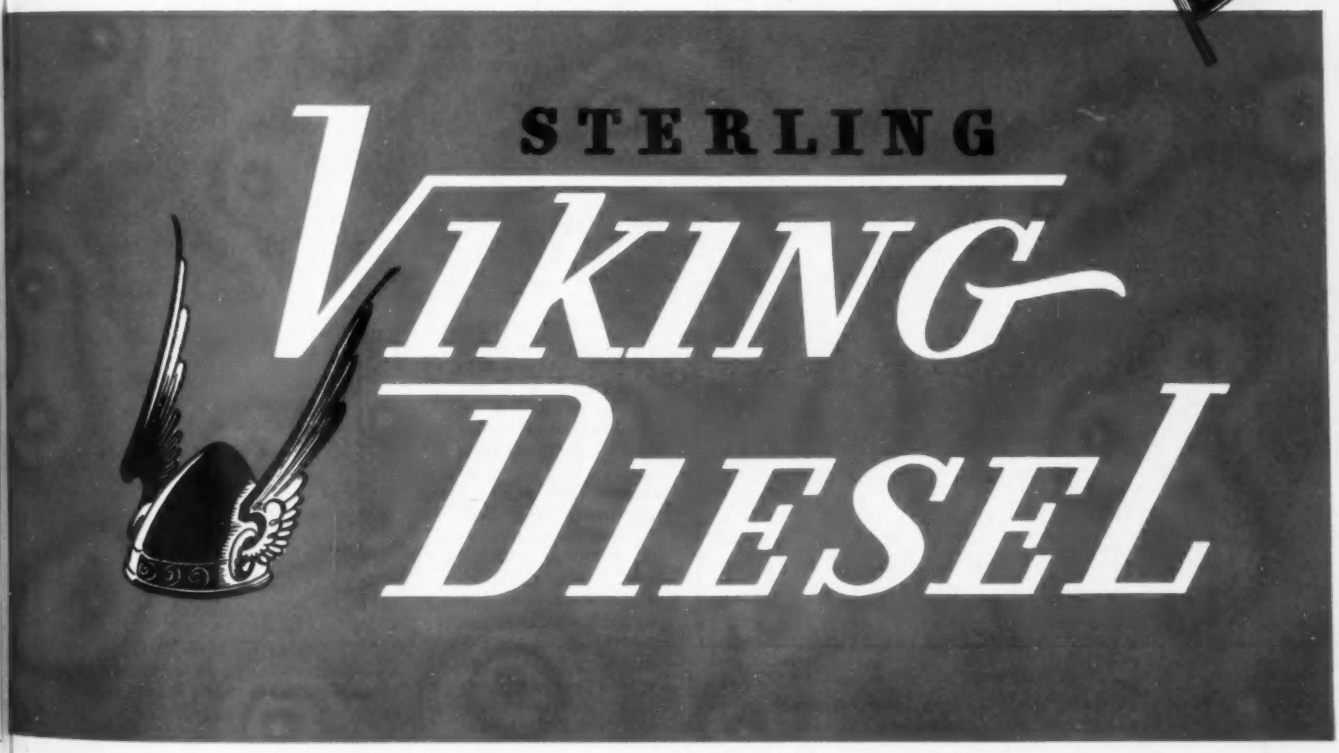
HORSEPOWER RATINGS AND WEIGHT

	6 CYLINDER *Unsupercharged*	6 CYLINDER *Supercharged*	8 CYLINDER *Unsupercharged*	8 CYLINDER *Supercharged*
CONTINUOUS	275 HP @ 1000 RPM	410 HP @ 1000 RPM	365 HP @ 1000 RPM	550 HP @ 1000 RPM
INTERMITTENT	325 HP @ 1200 RPM	495 HP @ 1200 RPM	440 HP @ 1200 RPM	650 HP @ 1200 RPM
WEIGHT WITH REVERSE GEAR	8,000 pounds	8,500 pounds	10,000 pounds	10,500 pounds
WEIGHT WITH REVERSE AND REDUCTION GEAR	10,000 pounds	10,500 pounds	12,000 pounds	12,500 pounds

ENGINE CONSTRUCTION

Cylinder Block: Cast iron enbloc construction. Removable cylinder liners. *Crankshaft:* Counterbalanced 6" main journals and 5" crankpins. Crankshaft drilled for full pressure lubrication. *Connecting Rods:* Forged steel, rifle drilled for pressure lubrication to piston pin. *Camshaft:* Located in cylinder block. Removable from side of engine. *Bearings:* Main bearings, connecting rod bearings and camshaft bearings are precision type steel backed. *Pistons:* Cast aluminum alloy, provided with six rings and full floating piston pin. *Valve Mechanism:* Dual intake and exhaust valves actuated by hydraulic lifters through push rods and rocker arms. *Timing Gears:* Helical gears located at forward end of engine. *Reverse Gear:* Bevel planetary type, manual or remote control. Thrust bearing located in after end of reverse gear housing. *Lubrication:* Pressure lubrication to all moving parts. Dry sump. Separate gear driven positive displacement pressure and scavenge pumps. *Cooling System:* Fresh water cooling. Separate gear driven self-priming centrifugal fresh water and sea water pumps. *Fuel Injection System:* Individual cam operated pumps. Nozzles located in center of cylinder heads. Fuel transfer pump gear driven positive displacement. *Supercharger:* Exhaust driven, located at after end of engine. Water-jacketed exhaust manifold. *Governor:* Hydraulic variable speed. Provision is made for remote control. *Starting System:* Two electric starting motors. Gear driven generator for battery charging. *Tachometer and Revolution Counter:* Gear driven electric tachometer and mechanical revolution counter.

"KEEP BUYING WAR BONDS"



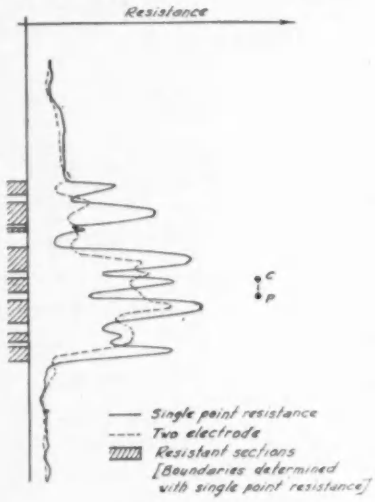


FIGURE 9-17
Example of unsatisfactory two-electrode curve in a broken sand section.

from those given previously as illustrations. However, one is usually not interested in knowing the resistivity of a sand at one given point, but rather in obtaining a reasonably accurate average value of the whole section. When the sand comprises one or several layers having a resistivity not too different from the main sand body (for instance when there are small lithological changes within the sand), the average curve given by the log will be nearly the same as if the whole section were homogeneous and had a resistivity equal to the average resistivity of the section. The same remark can be made if very thin foreign layers (less than one half the spacing length) of resistivity several times greater or smaller than that of the sand are imbedded in the section.

If the sand comprises a few sections several times greater than the spacing, and if the resistivity of these sections is quite different from that of the main body of the sand (hard streaks, shale breaks, for instance), then it is preferable to consider each section individually.

When the sand section is very broken and consists of very thin alternate layers whose resistivities are quite different, the procedure mentioned above cannot be applied. The curve obtained on this type of formation is usually an extremely distorted image of the actual resistivity distribution (see Figure 9-17), and it is not possible, in general, to determine the true resistivity of the various sections from the two-electrode log.

If the shales surrounding the sand are not perfectly homogeneous, but only roughly so, little change will be brought, in general, to the log obtained in the sand section. If quantitative data is desired on such a formation, it is permissible to consider the shales as being homogeneous and having a resistivity equal to the average resistivity of a short section (twice the spacing) above and below the sand.

If the formations are not isotropic, the magnitude of the apparent resistivity is different from that given by the preceding curves, usually less. The difference, however, is small and it can be neglected when the bed thickness is several times the spacing length. This is generally the case, owing to the smallness of the two-electrode spacings. For more information regarding the logging of anisotropic formations, the reader is referred to Part 5 of this series.

If the line of electrodes CP is not perpendicular to the stratification, namely, if there is an appreciable dip, or if the bore hole deviates from vertical by a considerable amount, the results derived for horizontal beds can be applied without modification so long as the angle between the axis of the bore hole and the line perpendicular to the stratification is less than 30 degrees. Even for larger angles, no correction is necessary if the resistant sections logged are thick (several times the spacing length).

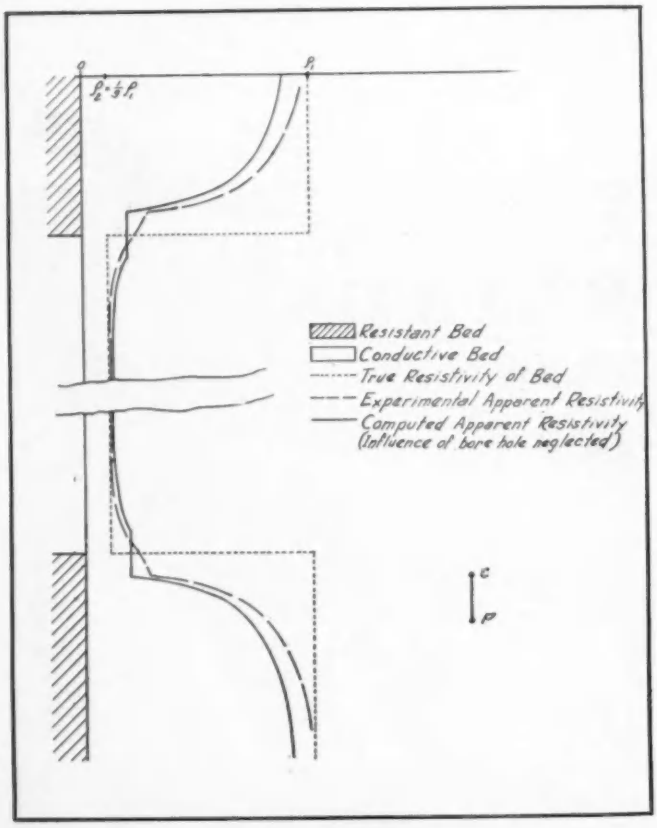


FIGURE 9-18
Two-electrode curve in a very thick bed nine times more conductive than the surrounding formation.

Conductive Beds

Figures 9-18 to 9-21 represent two-electrode curves obtained on conductive beds of relative thicknesses ∞, 4, 1, and 0.33, respectively. The relative resistivity of the beds, namely the expression $\frac{\rho_2}{\rho_1}$, was assumed to be 1/9. This could be, for example, salt water sands (not invaded, or slightly invaded by the drilling fluid) of resistivity ρ_2 imbedded in very thick shale sections of resistivity ρ_1. The solid lines are computed curves, obtained by neglecting the influence of the drilling fluid. The dash line curves represent the results which, most likely, would have been obtained if the influence of the bore fluid had been taken into account. These assumed curves have been established from the computed curves and from data given by actual logs. As usual, the dotted lines represent the true resistivity of the section.

It can be seen from the figures that the response of a two-electrode curve in conductive beds is quite similar to that of a four-electrode curve having the same spacing. Regardless of the bed thickness (except when the bed is extremely thin), the apparent resistivity is of the same order as the true resistivity, the best match, of course, being obtained for thick beds. The curves are symmetrical. The apparent thickness of the bed is always greater than the actual thickness, the difference being equal to the length of the spacing.

The response of a two-electrode curve on conductive beds not invaded by foreign fluids beig simple and well illustrated by the typical curves of Figures 9-19 to 9-21, no further discussion of this type of log is necessary.

Mud Invaded Sands

When salt water sands invaded by a relatively resistant mud are logged, the apparent resistivity, evidently, is higher than shown on the preceding figures.

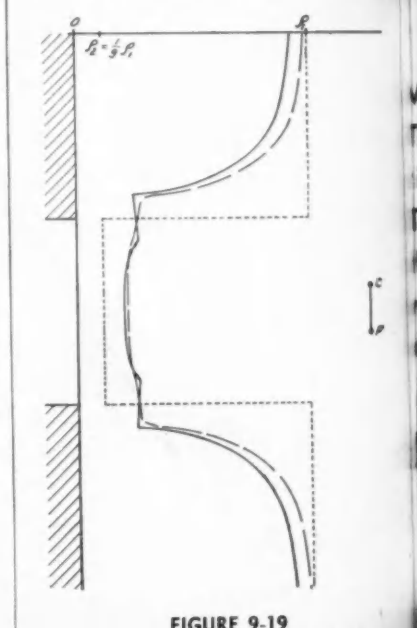


FIGURE 9-19
Two-electrode curve in a thick bed nine times more conductive than the surrounding formation.

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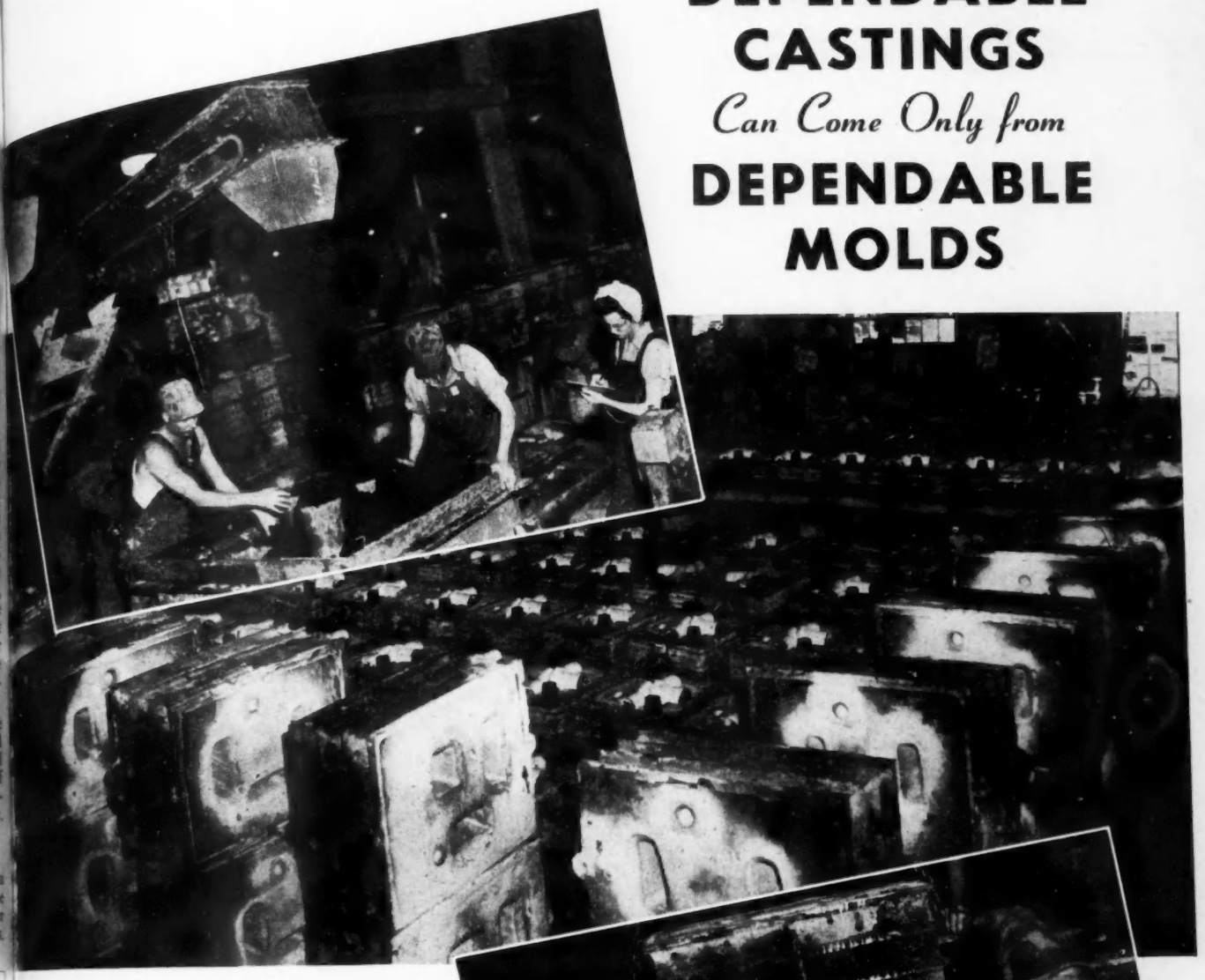
Can Come Only from

DEPENDABLE MOLDS



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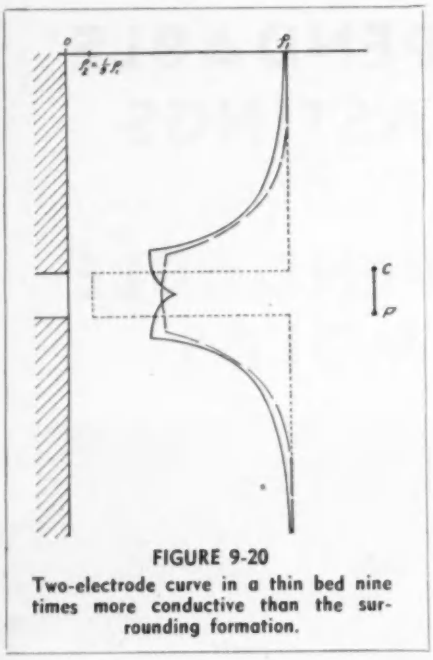

FIGURE 9-20

Two-electrode curve in a thin bed nine times more conductive than the surrounding formation.

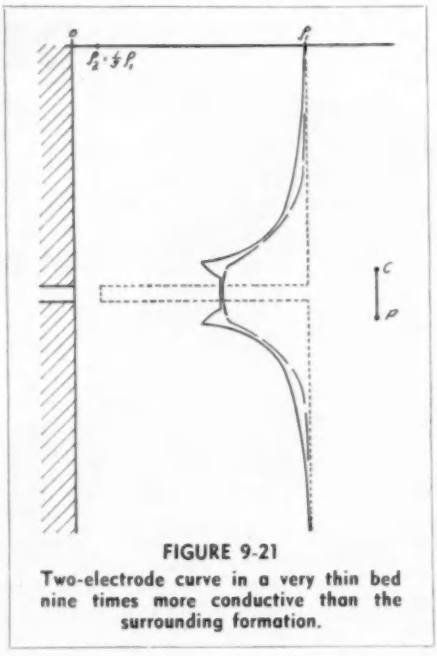

FIGURE 9-21

Two-electrode curve in a very thin bed nine times more conductive than the surrounding formation.

This condition is similar to that investigated previously when the logging of conductive beds by the three-electrode method was discussed. Qualitative results were summarized on Figure 7-5, which is reproduced here as Figure 9-22 for convenience. The curve shown at the lower left represents, approximately, the variations of apparent resistivity of a thick bed in terms of spacing. When a short spacing P_1 is used, there is no penetration effect at the level of the measuring electrode, and the log gives a resistance value related mostly to the drilling fluid contained in the bore hole (part AB of the curve). If the spacing is increased from P_1 to a larger value P_2, the influence of the resistant invaded section becomes preponderant and the log gives an abnormally high apparent resistivity (part DE of the curve). The average value of P_2 depends upon several factors. Under normal drilling conditions it is of the order of one foot. If the spacing is increased from P_2 to a certain length P_3, the apparent resistivity comes very close to the value ρ_2 of the non-invaded zone (part FG of the curve). The numerical value of P_3 depends, of course, primarily upon the amount of mud invasion.

The foregoing discussion can be summarized by saying that when spacings of increasing length are used (beyond P_3), the apparent resistivity of mud-invaded salt water sands gradually decreases. This does not necessarily mean, however, that, if the apparent resistivity of a permeable bed decreases with increasing spacings, the object bed is conductive. This important point will be discussed in a forthcoming article.

The Homology Principle

In all the preceding examples of two-electrode curves, only the relative resistivities and relative thicknesses have been considered. By virtue of the homology principle (see Part 5 of the series) these curves apply to any resistivity distribution, ρ_2, ρ_1, and ρ_m, provided the resistivity ratios equal the values postulated. They apply also to any thickness t, spacing s, and hole diameter d, provided the ratio of these quantities equal the assumed relative values. To illustrate the preceding remark, a specific case will be considered. Figure 9-4, for example, was established for the following set of relative values:

$$\text{resistivities: } \frac{\rho_2}{\rho_1} = 9 \qquad \frac{\rho_m}{\rho_1} = 1$$

$$\text{dimensions: } \frac{t}{s} = 4 \qquad \frac{d}{s} = 0.4$$

where ρ_2, ρ_1 and ρ_m are the resistivity of the sand, shales, and drilling mud, respectively. The curves of this figure apply, for instance, to the following set of absolute values:

The sand resistivity is	18 ohm-m
The shale resistivity is	2 ohm-m
The mud resistivity is	2 ohm-m
The bed thickness is	8 feet
The spacing length is	2 feet
The hole diameter is	9⅝ inches

The same curves apply as well if the experimental conditions are different, for example:

Sand resistivity	90 ohm-m
Shale resistivity	10 ohm-m
Mud resistivity	10 ohm-m
Bed thickness	6 feet
Spacing length	1.5 feet
Hole diameter	7¼ feet

because in these two cases there is perfect electrical homology and perfect geometrical homology (the electrical homology is entirely independent of the geometrical homology, and conversely).

Experimental data (not discussed here) show that the resistance curves are little changed when the mud resistivity and the hole diameter vary within reasonable limits, all other factors remaining the same. An important consequence is that the homology need not be rigorously observed for the ratios $\frac{\rho_m}{\rho_1}$ and $\frac{d}{s}$. In practice, this means that, with the usual hole sizes and drilling muds, the mud resistivity and the hole diameter, can be disregarded, especially when the relative resistivity of the object bed is not too high. All the foregoing data can therefore be applied by taking into consideration only the $\frac{\text{sand resistivity}}{\text{shale resistivity}}$ and $\frac{\text{thickness}}{\text{spacing}}$ homologies. Only when the relative resistivity of the bed is extremely high should the size of the hole and the mud resistivity be taken into consideration. This, however, is not done in practice because resistivities of such magnitude are usually an indication of impermeability, that is to say, an indication that the bed is without commercial importance.

The preceding remark regarding the simplification of the homology requirements is not restricted to the two-electrode method. It applies also to all the conventional multiple-electrode logging systems. This confers a wide range of applicability to the data given in these articles.

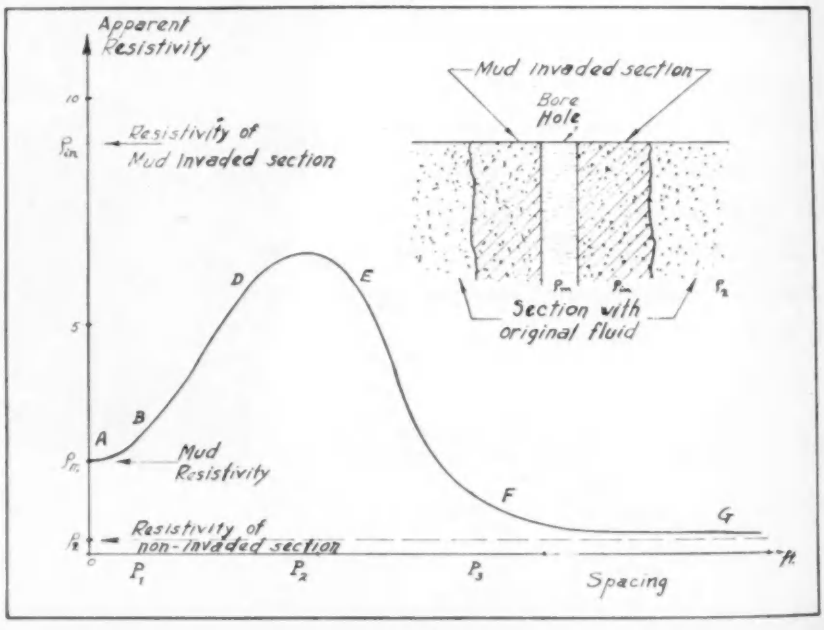

FIGURE 9-22

Changes in apparent resistivity in terms of electrode spacing for a mud invaded salt water sand (approximate).

How "Oilwell" No. 320 Triplex Steam Slush Pumps help drill deep wells FASTER and at LOWER COST

THE "Oilwell" No. 320 Triplex Steam Slush Pump provides in a single pump ample volume and pressure output for drilling the deepest wells with utmost speed and economy. The Triplex pump eliminates the need for compounding two duplex pumps, as sufficient pressure and volume are possible without assistance of another pump. This saves wearing parts and the need for expensive compounding valves and fittings.

The following advantages of "Oilwell" No. 320 Triplex Pumps have been proved in several years of severe drilling service:

1. Faster Penetration—Results from the increased jetting action of the mud passing through the water course of the bit due to the large-volume, high-pressure output of the pump.

2. Increased Footage per Bit—The greater force of the mud keeps the bit free of cuttings. Some operators report savings of 30 per cent and over in the number of bits used when drilling with the No. 320 Pump.

3. Less Steam per Hydraulic Horsepower—Tests show that the Triplex Steam End uses less steam per hydraulic horsepower than the duplex pump. The pump provides greater hydraulic horsepower for the deepest drilling and emergencies requiring great pressure.

BRIEF SPECIFICATIONS

Steam Cylinder Bore and Stroke.....inches	18 x 20
Standard Fluid Cylinder Liner Sizes.....inches	6½ and 7
Rated Steam Pressure.....p.s.i.	350
Rated Fluid Chamber Working Pressure:	
Suction .....p.s.i.	1,500
Discharge .....p.s.i.	3,000
Theoretical Displacement (Piston Rods Deducted) at 50 r.p.m. with:	
7-inch Liners.....g.p.m.	922
6½-inch Liners .....g.p.m.	785
Minimum Stalling Pressure at 300 p.s.i. Steam Pressure with:	
7-inch Liners.....p.s.i.	2,000
6½-inch Liners.....p.s.i.	2,300

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Comparison of Capacities of the No. 320 Triplex Pump and Typical Duplex Pumps

Pump Size	Type	Area Ratio Steam Piston to Fluid Piston	Stalling Pressure with 300 P.S.I. Steam at Pump	Working Pressure at 50 R.P.M. with 300 P.S.I. Steam at Pump	Theoretical Capacity at 50 R.P.M. in G.P.M.
15 x 7¾ x 20	Duplex	3.75 to 1	1125	843	770
16¼ x 7¾ x 20	Duplex	4.40 to 1	1320	990	770
18 x 7 x 20	Triplex	6.67 to 1	2000	1640	922

"OILWELL"

Characteristics and Quality of Water Important in Flooding Work

Equipment and material must not be corroded and oil sand pores must not be plugged in operations

THE quality and characteristics of water to be used for flooding operations is an important item contributing to the success of any water flood project and should not corrode material or equipment or plug the oil sand pores at any point between entrance to the sand at the input well and the producing well bore.

Reasons for treatment are of course quite evident in that the economic status of a flood project may be seriously unbalanced by material corrosion and excessive maintenance costs, while oil recoveries will be considerably decreased if sand pores are plugged as a result of flooding.

Accordingly, it is necessary that a water flood operator knows; (1) the exact chemical composition of the water to be used for flooding, (2) what undesirable actions or reactions will be experienced by the use of the water and (3) required treatment to neutralize or minimize effect of undesirable constituents in the water.

The fact that commercially distilled water contains impurities readily illustrates that chemically pure water is practically non-existent under natural conditions. Water which most nearly approaches chemical purity is rain. However, it contains dissolved gases through its contact with the atmosphere, organic matter and suspended particles of dust and dirt.

Impurities in water are further increased when, after falling to earth, that part of the rain water which flows over the surface will pick up organic material and suspended matter from the earth, while that which penetrates the earth, and helps form the underground water system, takes into solution many compounds dissolved from rock formations with which it has come into contact.

Analysis Necessary

By impurities therefore is meant the solid material, organic growths, dissolved gases and chemical compounds taken into the water from the time it falls as rain until it is ready for use. Solid materials, some chemicals (such as iron or those which cause deposition of insoluble substances formed by chemical reaction) and organic growths must be removed to prevent plugging of sand pores while other chemicals and dissolved gas must be removed to prevent corrosion.

Determination of water constituents is done by chemical analysis. This furnishes information regarding suitability of the water and gives the basis for prescribing treatment. Samples taken for the initial analysis should be handled with extreme care to avoid any contamination, so a complete analysis may be made.

To properly diagnose the analysis each constituent may be placed in one of the following general categories to determine treatment processes:

1. Suspended matter
2. Organic growths
3. Corrosive gases
4. Corrosive properties
5. Iron
6. Manganese

These six items are further grouped thus:

Sand plugging action: Suspended matter, organic growths, iron, and manganese.

Material and equipment corrosion: Corrosive gases and corrosive properties.

By suspended matter is meant the amount of solid material carried by the water. Removal of suspended matter is of extreme importance due to its sand plugging action. Filtration alone will not effectively remove all suspended matter since pores in the filter are larger than the pores in the oil sand, therefore a coagulent such as alum is added to the water before filtration. This forms a floc or jelly-like precipitate which takes up the tiny particles of matter and permits effective filtration.

Considerable time should be allowed following addition of alum before filtration, else part of the floc may not be formed until after the water has passed through the filter, which will seal sand pores.

The amount of alum to be used can best be determined by experimentation and should be such that an effective floc is formed but not in amount sufficient to unbalance the pH value and cause corrosion.

In addition to suspended matter and insoluble impurities this coagulation-filtration process also removes precipitated iron. In order that solution iron may also be removed by this process it is necessary to aerate the water prior to filtration so the air may oxidize the iron, putting it in a filterable state.

Considerable time is required for complete oxidization and care should be exercised that oxidization following filtration does not take place, thereby forming a pore-plugging substance. Soluble iron in quatnity exceeding .1 parts per million is a potential trouble maker.

Aeration for oxidization of soluble iron also removes pore-plugging manganese by forming insoluble oxides and hydrates that are easily removed by filtration. Manganese in excess of .5 parts per million usually should be removed.

Although aeration permits formation of filterable compounds of iron and manganese, it complicates the picture because considerable oxygen may be taken in solution during the process, thereby increasing corrosive action of the water. This is counteracted by liberation of carbon dioxide and hydrogen sulphide gas which may be present in the water, and which contribute to corrosive properties.

If iron is in solution and solution oxygen presents a problem, water can be handled in a closed system, and manganese removed by means of base exchange through zeolites.

Organic growths, or algae which have rapid growth, represent another sand pore-plugging item to be considered. If present in flood water, removal may be accomplished by dosing water with chlorine or copper sulfate. The latter is preferable due to objections to adding a corrosive gas to the water, and the danger of chlorine to the inexperienced operator. One pound of copper sulfate per 75 to 100 thousand gallons of water should prevent algae growth accumulation, and is best applied by dissolving in warm water and put in the top of the tank of water being treated.

Eliminating Corrosion

By the foregoing methods, suspended matter, organic growths, iron and manganese, or the sand-plugging items may be removed. In addition to those considerations should be determination of treatment required to neutralize corrosive action.

A major contribution to corrosion is offered by corrosive gases. Of these, carbon dioxide and hydrogen sulfide may be removed by aeration. However, this does not remove, and permits presence of oxygen in solution. If all three of these gases exist, removal of the oxygen may be accomplished by mechanical means, or de-aerators.

Though gases are of extreme importance in diagnosis and control of corrosive properties of water, a main item for consideration is the alkilinity or acidity of the solution, or the hydrogen-ion concentration. This is expressed as a number (logarithm of the reciprocal of the hydrogen-ion coscentration) and is known as the pH value. In pure water there is the same number of hydrogen and hydroxol ions present and the pH value is 7, denoting a neutral or neither alkaline nor acidic solution. pH values less than 7 denote acidic solutions, while values over 7 denote alkaline solution.

The pH value is important and should be controlled in flood water. If water is acidic, or has a pH value less than 7, specific amounts of alkali must be added to the water to inhibit corrosion, by forming a protective coating in a pipe and equipment. As a rule a pH value of 7.2 or over is required to maintain a protective coating on material.

Lime is generally used to raise pH to a safe alkaline value but careful control must be exercised to prevent overdosage. As an alternate to this the water may be passed through beds of broken limestone.

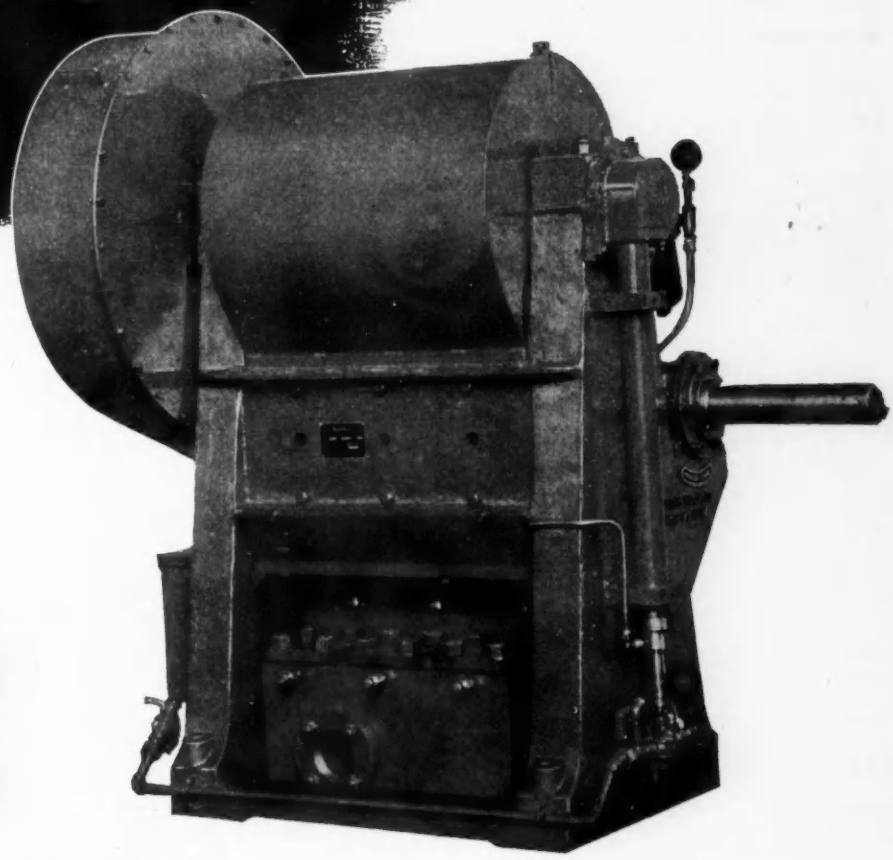
As a general rule the pH value should be somewhat above 7.2 and alkalinity should exceed 20 parts per million to prohibit corrosion.

The foregoing items are those which usually require control, if present. In most cases the water flood operator is required to control only one or two of these but all are listed to present a total picture of what may be expected in the way of treatment.

It cannot be emphasized too strongly that exact control must be exerted on flood water (if required) to prevent pore plugging and material corrosion if an efficient and economic project is expected.

for the severe conditions of ....

Water Flood Service



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Especially designed to meet the unusual and severe requirements of water flooding, these massively constructed pumps assure low operating cost and long life.

In these Aldrich Vertical Triplex pumps all working parts are readily available for inspection and adjustment. The crankshaft, with cranks set 120° apart, produces a continuous and almost uniform discharge which results in smooth operation and high efficiency. Complete automatic forced-feed lubrication through rifle-drilled crankshaft to all bearings is an optional feature, as are the crankshaft covers, which make pump totally enclosed. A variety of drives are provided to suit the users' requirements. The drive arrangements consist of an extended crankshaft for belt or chain drive to prime mover.

"Kosmos" Porcelain Plungers, which have become almost universal for water flood service, are recommended for use on these pumps because of the many savings realized by their use, although regular or special alloy metal plungers can be supplied.

A complete line of sizes and ratings are available, write today for Data Sheet No. 25 which contains detailed information.

Other Aldrich Pumps for water flood service include inverted types for either inside or exposed locations.

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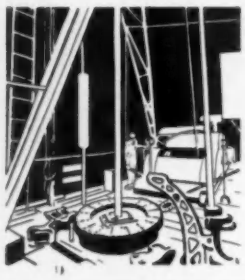
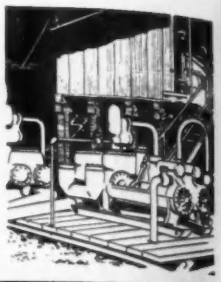
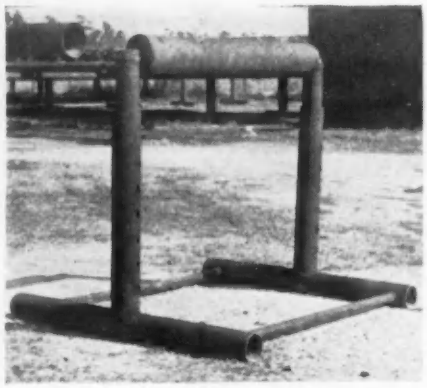


OPERATING HINTS *For Drilling Crews*



Roller Aids Handling Of Racked Drill Stem



Adjustable legs bring roller unit to level for transfer of pipe over gap between rack sections.

DRILL PIPE HANDLING

To assist in the handling of drill pipe, especially when replacing tool joints, one company has designed and built an adjustable, roller top, portable, telescoping frame, entirely from salvage materials. The width of the roller frame is approximately 3 feet, with the height at the lowest possible point about the same. The base is made of 3-inch pipe with 2-inch pipe used as bracing. The uprights are of 4-inch pipe with the telescoping sections of 3-inch pipe. The roller is constructed of 4-inch pipe with the ends closed and an axle welded on each end and then set into a socket in the telescoping section of the upright. The telescoping section has hole drilled, as has the upright section, so that a bolt may be placed through both the upright and the telescoping section to hold the adjusted roller in place.

Reversing Device Cuts Manpower at Pipe Rack

MANPOWER SAVING

Quite often it is necessary to reverse ends of drill pipe while it is on the rack, necessitating two or more men to do the work. To facilitate this handling and to save manpower, as only one man is required, one company has constructed a roller attached to the side of the drill pipe rack. With the aid of this roller one man can turn end for end a joint of drill pipe of average size.

The roller is constructed of a heavy axle covered with a thick rubber sleeve. The axle is keyed to arms made of heavy plate steel. The arms are then welded to the side of the pipe rack. The roller is set level with the pipe rack so as not to restrict racking of the drill pipe.

One man can easily lift the end of a joint of 4-inch or smaller drill pipe and by placing one end on the roller he can move the pipe to near the middle of the joint, then turn end for end with ease and safety.

Roller carried on side of rack member affords pivot for one-man reversal or transfer of pipe joint.

$5.00 is paid for each illustrated acceptable contribution. Mail to The Editor, THE OIL WEEKLY, P. O. Box 2608, Houston 1, Texas

Skeleton Steel Bases Increase Derrick Bearing

DERRICK FOUNDATIONS

In a move to cut down rig installation costs one company found a much simpler and less complicated means of setting up the four derrick leg bases. Instead of the conventional elevated concrete block, a broad base of heavy planking some nine feet on a side was laid at each corner, the top of it being brought up to ground level. Atop this platform was laid the derrick base consisting of an 8-foot square, all-welded structure made of heavy steel I-beams. All corner bases are tied together by bolting horizontal I-beam stringers to the corner mats. The derrick leg then is bolted to the center of the base in the normal manner.

This method of mounting the drilling derrick has been used on deep wells —10,000 feet and deeper—and has given excellent service. Not only is time and expense saved in rigging up and dissembling the rig, the same equipment being unitized and used over and over,

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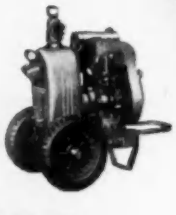

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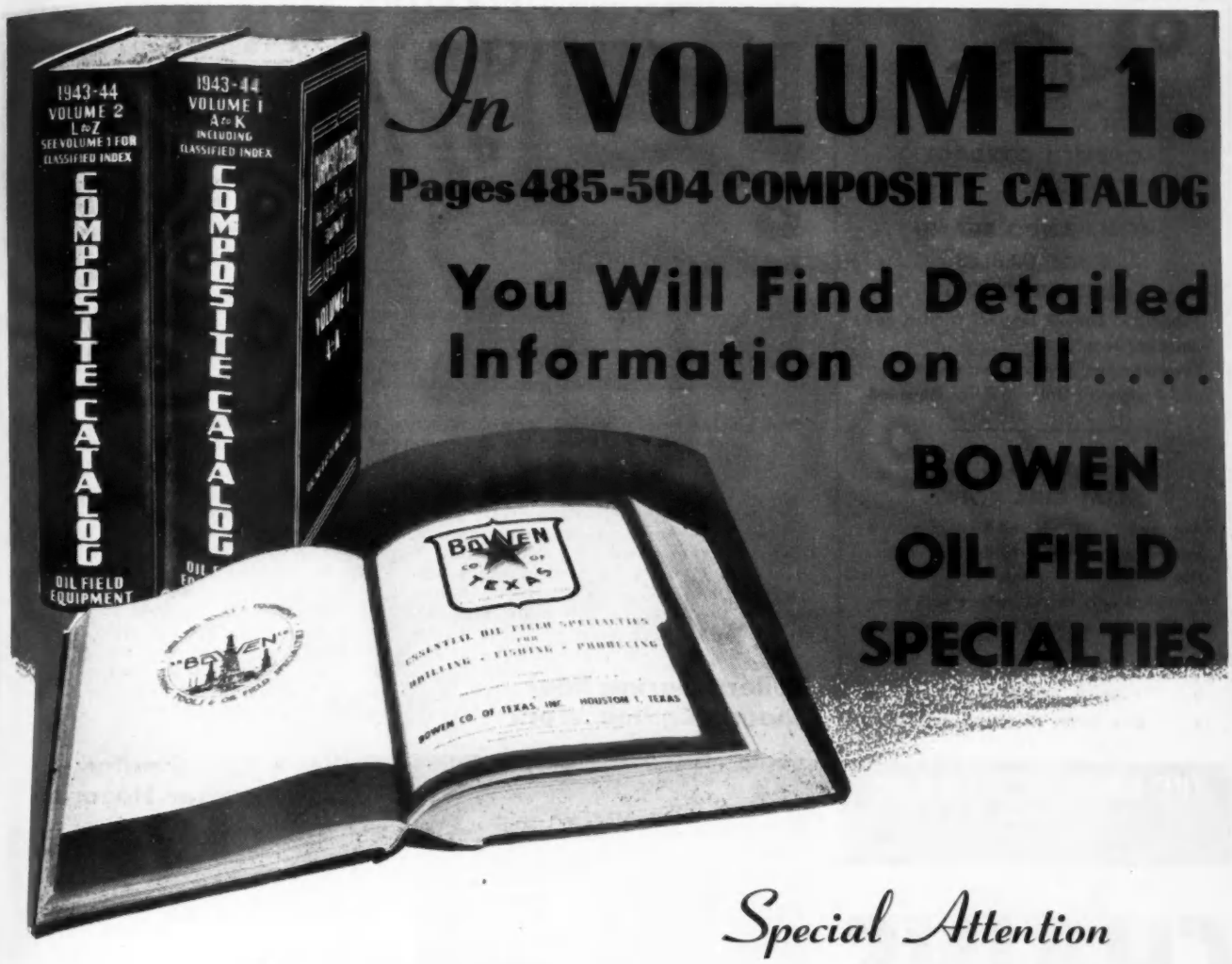

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Pages 485-504 COMPOSITE CATALOG

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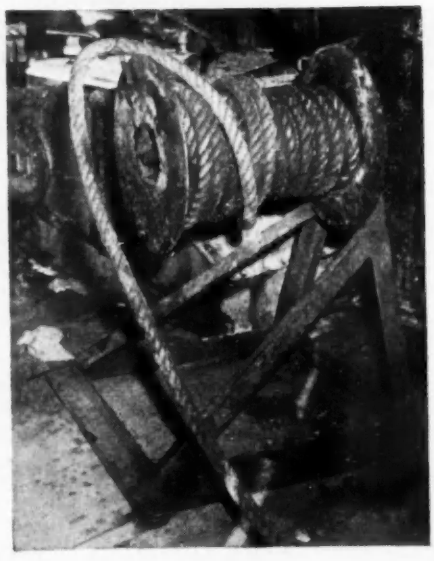
Prefabricated base of welded beam construction carries derrick weight across wide footing and provides support without the construction of relatively large concrete precast pier.

but also a minimum of re-arrangement of bases, tie-downs, fittings, etc. is required to set up production equipment. Typical of the cases in which time is saved is where a light production derrick is installed, its bases being bolted simply to studs in the main mat beneath the drilling floor.

Roller-bearing Reel Speeds Catline Work



Mounted on bearing salvaged from auto front wheel, this free-spinning reel affords handy storage.

CATLINE STORAGE

To speed handling and improve between-job storing of the catline on the derrick floor, one superintendent built up a free-spinning reel supported from only one end on a conveniently placed rack or stand located behind the driller's cat-head. An automotive wheel spindle and bearing assembly was inserted in and bolted to the hollow center of one end of a light shop-made steel reel. The other, exposed side of the spindle was then bolted to an all-welded angle-iron stand of sufficient height to bring the axle of the well-balanced reel up some four feet.

A simple but effective means of quickly securing the loose end of the line consists of a short steel rod welded to the outer rim of the reel and which had been twisted through one complete turn, making in effect, an open coil, the latter being spread apart just far enough to accommodate the particular size cat-line, as shown in the photograph. A quick flip of the line will release it, yet, when held in this position between jobs, or to prevent the reel from paying out more than needed, it will not unwind itself to become entangled underfoot.

Driller's Spot Heater Beats Weather Hazard

WORKING CONDITIONS

Weather conditions in higher terrain, particularly in coastal areas, sometimes become uncomfortably cold even during summer time, especially during the night tours, and the driller who cannot move about or seek comfort near a heater in the doghouse must remain at his post and "take" it. To alleviate this condition, the superintendent of one company had installed near the driller's position on each rig an inexpen-

Nested behind brake lever, this unit takes live steam from line and radiates at driller's feet.

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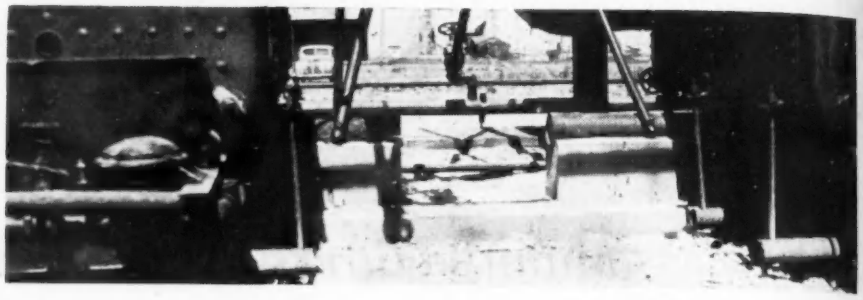
sive, easily-built steam heater. Simple in design, it consists merely of five short vertical lengths of 1½-inch pipe joined together in a header, top and bottom, and the whole connected into any convenient steam line below the rig floor.

The heater is sufficiently small and compact that it does not take up valuable floor space and yet it provides ample heat near the driller's legs to maintain a comfortable temperature. A length of 2x4 bolted to the top of the upper header provides a comfortable foot-rest when the driller is sitting on a stool near the controls.

Concrete Boiler Piers Align Entire Battery



Cast the full length of the boiler setting, with 2-foot gaps between units, this pier is faced with heavy pipe bearing members to afford expansion freedom and radiate excessive boiler heat.

BOILER SETTINGS

Leveling of the boiler setting for wells which are scheduled to require considerable drilling time justifies the expenditure of a little more time in preparing for the set-up than when shallower drilling is contemplated. One contractor casts a concrete wall along the line where the support of the firebox end of the battery is to be, making elevated sections some two feet wider than across the mud-ring dimension, and setting a piece of drill pipe along the top to act as actual bearing contact with the boiler.

Use of the pipe provides a bearing which permits slight shift of the boiler under expansion, and also serves to conduct away enough heat so that the top of the pier is not cracked or spalled even when the boiler is forced.

The gap between adjacent boiler supports is ample for working around the units, and no hazard is created as is the case where through beams are used.

Inset Channel Guards Tool Box Contents

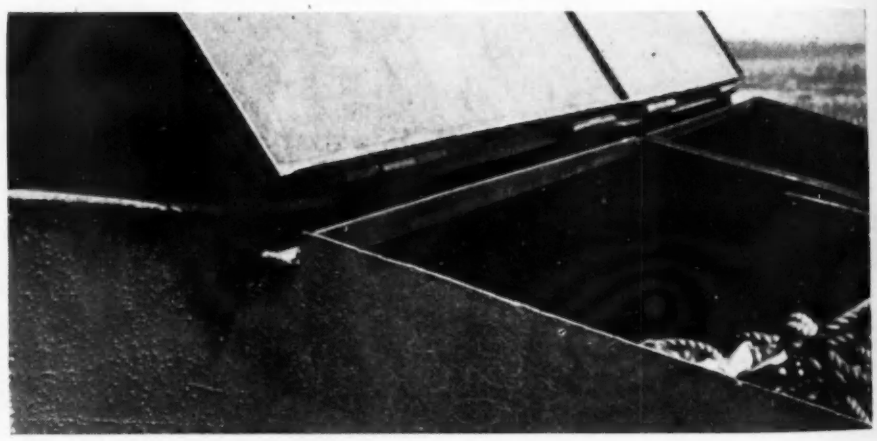
HAND TOOL PROTECTION

Rain entering the tool box through the joints at the hinged sides of the covers can cause serious damage to cordage stored within the box, as well as aiding corrosion of tools and other steel parts carried therein. One contractor eliminates this difficulty by setting into the top of the box, under the joining of top and hinged covers, a light channel which entends through the box and projects slightly from each end. A second channel member, at right angles to the first, extends down the line of junction between the two halves of the cover, and serves to intercept the drip from the sides of the covers.

The covers are fitted with lips or flanges on all sides, these members overlapping the edges formed by the box and channels, so as to give a joint which is weather-tight, even against a severe blowing rain.

In addition to providing built-in drains for the cover edges, the two channels, being welded throughout the length of their contact with the box top, add structurally to its strength without adding materially to the weight.

If the ends of the cross channel be allowed to project an inch, drainage is carried clear of tool box sides and painting saved.



Notched into side walls of tool box, and seal-welded to carry drainage outside the unit, these channels provide recess for box-top angles and insure against penetration of water onto contents.

Crude Stocks Continue Decline Despite Jump of 19,000 Barrels in Daily Output

Notwithstanding a jump of 19,000 barrels daily in crude oil output for the week ending September 30, stocks of crude continued to decline, as did gasoline stocks.

Continued draft on crude in storage brought the total to 221,490,000 barrels, 499,000 barrels below the previous week's figure. Gasoline stocks were reduced by a daily average of 344,000 barrels, leaving the total at 78,028,000 barrels.

All other products showed gains during the week and there was an increase in the amount of crude oil put through refinery stills.

Commenting on gasoline stocks recently, Petroleum Administrator Ickes said that as compared with the same time in 1941, our percentage of civilian grade gasoline in storage now is about half what it was. Refinery production of this grade of gasoline for the first eight months of this year averaged 1,225,000 barrels daily. During the first two weeks in September, this figure jumped slightly, reaching 1,231,800 barrels daily. However, during the last two weeks in the month, demand for civilian gasoline at refineries and terminals in the United States averaged 1,317,800 barrels daily, exceeding production by 86,000 barrels daily. "Peak seasonal demands are diminishing," Ickes added, "and a slight temporary reduction in military demand should result in maintaining stocks near their present level of approximately 40,000,000 barrels, of civilian grade." Although this stockpile is near minimum working levels, the PAW administrator believes it is "barely sufficient to take care of any reasonable fluctuations between demand and refinery production during the balance of this year."

Supplies of both light and heavy fuel oil gained, gasoil and distillate showing 548,000 barrels more than last week, and residual fuel showing an increase of 1,712,000 barrels. Production of both these products is being emphasized in order to build supplies of heating oil as high as possible before the peak season for use arrives.

Stocks of gasoil and distillate now stand at 45,329,000 barrels. Residual fuels on hand amount to 64,226,000 barrels. As compared with a year ago, gasoil and distillate stocks are up 13.9 percent. Residual fuels are still below the total for last year by 3.9 percent.

Crude run to stills amounted to 4,775,000 barrels during the week, or 97.3 percent of total refining capacity. Gasoline production gained over the previous week by 653,000 barrels daily.

Trends of Operations and Changes in Stocks

Figures on crude stocks are from Bureau of Mines weekly reports; all others from American Petroleum Institute weekly reports, which are estimates on Bureau of Mines basis.

(All figures in thousands of barrels—add 000)

HIGHS AND LOWS OF RECENT YEARS

ITEM	Crude Oil Prod.		Runs to Stills		Crude Stocks		Gasoline Stocks		Gasoil and Distillate Stocks		Residual Fuel Oil Stocks	
	Barrels Daily	Week Ended	Barrels Daily	Week Ended	Barrels	Week Ended	Barrels	Week Ended	Barrels	Week Ended	Barrels	Week Ended
Highs:												
1941	4,337	11–22	4,120	10–18	266,187	3–29	99,727	3–29	[1]54,983	11–15	102,448	1– 4
1942	4,337	2– 7	3,961	1– 3	263,208	3–28	[1]109,281	3–14	49,861	11–14	95,857	1– 3
1943	4,436	11–13	4,331	12– 4	245,752	5–29	94,159	3–20	46,187	11–27	72,881	1– 2
1944	[1]4,675	9–16	[1]4,752	6–17	240,992	1– 1	89,162	4– 1	45,329	9–30	64,226	9–30
Lows:												
1939	[3]1,601	8–26	3,125	2–18	[2]229,127	10–12	71,152	10– 7	20,722	4–15	105,397	4– 8
1941	3,364	1–11	3,490	1–18	240,399	11–15	79,923	10– 4	28,382	4–12	90,914	7–12
1942	3,297	7– 4	3,393	5–23	231,896	12–12	75,934	12– 5	29,240	4–25	72,962	12–26
1943	3,821	1– 9	3,579	3–13	232,191	1– 9	68,182	10–16	30,732	4– 3	57,596	12–25
1944	4,357	1– 1	4,228	2–12	[4]220,931	9– 9	76,302	1– 1	30,232	4–29	49,737	3–18

TRENDS OF 1943 AND 1944

Trends in Week Ended:	Crude Oil			Gasoline		Gasoil and Distillate		Residual Fuel	
	Production Daily	Runs to Stills Daily	Stocks Week End	Production Weekly	Stocks Week End	Production Weekly	Stocks Week End	Production Weekly	Stocks Week End
1943:									
January 2	3,871	3,734	233,938	10,957	82,420	4,285	42,913	7,683	72,881
January 30	3,826	3,698	233,863	10,339	88,830	3,888	37,057	7,452	70,763
February 27	3,873	3,709	235,217	10,566	93,157	4,230	32,939	7,839	70,140
March 27	3,896	3,742	239,126	10,231	94,079	3,541	30,980	8,018	67,938
April 24	3,913	3,737	242,035	10,583	91,001	3,954	31,142	8,168	67,455
May 29	3,970	3,679	245,752	10,656	83,937	3,798	32,274	7,672	67,682
June 26	3,955	4,015	242,657	11,092	79,589	3,876	34,044	8,126	67,960
July 31	4,133	3,788	238,420	11,127	74,977	3,765	36,363	8,478	66,877
August 28	4,196	4,227	236,170	12,420	72,525	4,351	37,928	8,732	67,250
September 25	3,344	4,156	233,013	12,206	70,024	4,608	40,328	8,560	66,659
October 30	4,383	4,176	247,219	12,813	69,297	4,642	44,591	7,968	63,833
November 27	4,414	4,261	239,761	12,638	69,980	4,379	46,187	8,633	62,143
December 25	4,363	4,185	241,310	12,597	74,024	4,457	43,791	8,689	57,596
1944:									
January 1	4,357	4,453	240,992	13,192	76,302	4,575	42,310	9,141	57,330
January 29	4,409	4,359	240,251	13,427	81,085	4,054	37,266	8,889	52,857
February 26	4,423	4,377	237,137	13,183	85,248	4,558	33,766	8,952	51,387
March 25	4,385	4,443	236,285	13,362	87,287	4,979	31,319	9,013	51,669
April 1	4,383	4,435	234,667	13,824	89,162	4,450	30,530	8,367	51,326
April 29	4,431	4,300	235,342	13,126	88,462	4,284	30,236	8,398	49,985
May 27	4,514	4,532	234,423	13,502	86,468	4,702	32,035	8,568	49,812
July 1	4,587	4,638	228,860	14,052	83,559	4,496	35,360	8,872	52,235
July 29	4,608	4,627	225,112	14,115	82,665	4,833	38,135	8,900	56,280
August 26	4,667	4,698	222,931	14,112	80,740	4,566	41,543	8,680	59,839
September 2	4,657	4,592	223,482	14,265	79,921	4,664	41,964	8,293	59,876
September 9	[1]4,689	4,584	[4]220,623	14,093	79,576	4,440	43,053	8,999	60,785
September 16	[1]4,745	4,585	221,989	14,201	78,726	4,470	43,556	8,214	62,240
September 23	4,743	4,608	221,490	13,841	78,372	4,471	44,781	9,180	62,514
Sept. 30, 1944	4,762	4,775	.....	14,494	78,028	4,622	45,329	9,292	64,226
Oct. 2, 1943	4,327	4,204	[5]233,978	12,475	69,260	4,534	39,806	8,511	66,827
Change:									
In week	+19	+167	—499	+653	—344	+151	+548	+112	+1,712
In year	+435	+571	—12,488	+2,019	+8,768	+88	+5,523	+781	—2,601
In year	+10.1%	+13.6%	—5.3%	+16.2%	+12.7%	+1.9%	+13.9%	+9.2%	—3.9%

[1] All time peak. [2] Lowest between January, 1922 and July 1, 1944. [3] Lowest since October, 1922, due to shutdown of six Mid-Continent states. [4] Lowest since December, 1921. [5] Stocks, September 25, 1943.

Humble Case to Be Heard In November on Merits

The United States Circuit Court of Appeals for the Fifth District (New Orleans) sitting at Atlanta, Georgia, October 3 set for November 6 at Fort Worth, a hearing on its merits of Humble Oil & Refining Company's controversy with the National Labor Relations Board over the question of a maintenance-of-membership clause in the contract between the company and the CIO, bargaining union for workers in the refinery at Ingleside, Texas.

The company obtained in the federal court at Dallas an injunction against federal agencies seizing the plant. This injunction was suspended by the circuit court at New Orleans on the plea of government attorneys that seizure of the plant was not impending nor contemplated. The hearing at Atlanta was on this suspension of injunction, the latter action being upheld by the latest ruling. It was said that this order does not overrule the Dallas court decision but freezes relations between the company and the government agencies pending hearing of the case.

Skelly Company Observes Its 25th Anniversary

Skelly Oil Company, Tulsa, observed its 25th anniversary October 2 by distributing a brochure outlining its progress.

The company was organized in 1919 by William G. Skelly, who has continued actively as president. Originally a producing unit, the firm has increased its activities to include refining, pipe line and marketing.

International Developments

Mexican Flood Results In Huge Petroleum Loss

Fire and flood which followed torrential rains in the oil regions in the state of Vera Cruz caused damage estimated at 3 to 5 million pesos.

The Mexico City offices of Petroleos Mexicanos revealed that the giant duct which transports virtually all of the city's supply from the Poza Rica wells to the Azcapotzalco refinery had been broken in three places. Much oil was lost when flood waters prevented workers from closing the valves of the shattered pipe line and more went up in flames that broke out at several points.

An immediate aftermath of the disaster was an acute fuel shortage in Mexico City. Automobile traffic declined, several bus lines suspended operations and taxi rates rose to fantastic figures. To conserve reserves, gasoline was rationed throughout the district on the basis of 80 to 85 liters a day for buses down to five a day for pleasure cars.

Efforts to ship fuel to the city by rail were held up by the breakdown of bridges, including the 4,000,000-peson span over the Cazones River.

Pantepec Reveals Plans For Blocks in Venezuela

Pantepec Oil Company of Venezuela, in a special bulletin to its stockholders, has explained details of arrangements recently made with Atlantic Refining Company to explore, develop and operate concession blocks held by Pantepec in Venezuela, representing properties not assigned to the Creole Petroleum Corporation. Pantepec retains a 50 percent interest in the blocks, to be operated on a unitized production basis.

The Atlantic company is now conducting geophysical and geological work on concessions comprising the Pirital block, State of Monagas, on which four of the eight exploratory wells stipulated in the contract are to be drilled. Similar work is also under way on other proposed drilling blocks selected by the Atlantic company from the six designated by Pantepec. Drilling equipment, transportation units and three rigs have been ordered by Atlantic for carrying out this program, and the company expects to have two of the rigs in operation in the Pirital block before the end of the year. The property is a short distance west of the Santa Barbara-Mulata fields, and adjoins Mene Grande's Travieso No. 3 concession, on which 11 producing wells have been completed, and three others are being drilled.

Colombian Oil Production Shows Gain During July

The ministry of mines and petroleum of the Republic of Colombia reported that oil production in both the Barco and De Mares concession areas was greater during the month of July than in the preceding month.

Production and increases by fields were as follows: Infantas—292,226 barrels, up 17,542; La Cira—1,324,711, up 63,158, both in the De Mares area. In the Barco, production from the Petrolea field in July was 350,522 barrels, up 20,869; and from Tibu, 86,675 barrels, up 29,327. Total increase for the month amounted to 130,896 barrels. These figures represent total commercial production for all of Colombia, since no other proved producing properties have shipping outlets.

Eight Southern Chile Wildcats Are Failures

Reports on petroleum explorations in the vicinity of Punta Arenas, extreme Southern Chile, are that eight dry holes have been drilled within a radius of 25 miles, on a seismograph structure. It is also reported that the Corporacion de Fomentos de Production, Chile, has expended most of its appropriation without discovering any new petroleum reserves. American companies interested in the possibilities of the country are unwilling to undertake exploration and development, due to prohibitive royalty terms of the Chilean government.

27 of 51 Wells Planned in Mulata Field Completed

Creole Petroleum Company on September 1 had completed 27 of the 51 wells called for under the PAW plan for the Mulata field, leaving 24 more to be put down before the end of the year. Six rigs have been in continual operation in the field since the early part of the summer.

Up to September 1, a total of 72 wells had been completed in the field, of which 63 are natural flow producers, 3 are gas wells, 4 dry holes, and 2 abandoned wells. Daily average production of the field in August was 22,500 barrels, although it is estimated that the rate will reach 32,000 barrels daily by the end of the year. Pantepec holds a 50 percent joint interest in the yield from this field.

Venezuelan Pipe Line to Be Completed in December

Originally scheduled for completion by November 15, the 16-inch pipe line from the Jusepin and Mulata fields to Puerto La Cruz, on the Venezuelan coast, is not expected to be in service before December. Approximately 50 miles of 116-mile line had been laid up to mid-September, from the terminal inland through the mountain ridges near the coast. The line will handle 97,000 barrels daily, which will practically assure realization of the PAW goal of 1,000,000 barrels daily from Venezuelan fields before the end of the current year.

☆

E. O. PERKINS has been promoted to general superintendent of the terminal division, refining department of The Texas Company, succeeding J. E. Blake, who has been named assistant general sales manager of foreign operations.

☆

CHARLES B. READ, geologist for the United States Geological Survey at Albuquerque, New Mexico, addressed the Tulsa Geological Society October 2 at the University of Tulsa, on "Geology and Upper Paleozoic Stratigraphy in Portions of Northeastern New Mexico."

Low-Gravity Asphalt Crude Flow Diverted by Tariff

Diversion of low-gravity asphalt-grade crude from the Hawkins field, East Texas, from tank car shipments to trunk lines and tankers in reaching asphalt plants on the East Coast will follow the posting of joint tariffs by Humble Pipe Line Company, The Texas Pipe Line Company and Empire Pipe Line Company. The trunk line rate from Hawkins field to the coast is 12½ cents per barrel, with Humble Pipe Line Company receiving an additional 5-cent gathering fee. The latter makes deliveries to the connecting lines in the Longview sector of the East Texas field. Initial pipe line-tanker movement will be 6000 to 10,000 barrels daily, and may eliminate rail movement as tankers become available. Humble Pipe Line Company dispatched 14,000 barrels of Hawkins crude daily by rail last month to Colonial Beacon Oil Company's Everett, Massachusetts, refinery, and 1000 barrels daily to the Baltimore plant of Standard Oil Company of New Jersey.

Gulf Tying Winnsboro Area To Mid-Continent Pipe Line

Gulf Refining Company is laying a 3-mile 4-inch crude line from the Winnsboro 2-pay deep area, Wood County sector of East Texas, to tie into its Mid-Continent trunk line system. Gulf Oil Corporation has 2 wells on production, and competitive development is scheduled. The oil is high gravity Mid-Continent grade.

Jim Wells-Brooks County Is Line Planned by Sun

Sun Pipe Line Company will expand its crude gathering system in Southwest Texas through the construction of 7 miles of 8-inch from its A. T. Canales field station, Jim Wells County, to the Dan Sullivan field, Brooks County, where Sun Oil Company has a prolific wildcat producer and considerable development scheduled. Crude gathered by the system is delivered to Magnolia Pipe Line Company in the Seeligson district, but Sun Pipe Line Company contemplates the laying of a trunk line to deepwater facilities on the coast when priorities make such a project possible.

Filing of Used Equipment Reports Is Suspended

The Office of Price Administration has suspended filing of reports by dealers in used oil field equipment and petroleum-refining machinery during the final quarter of 1944.

This does not mean there will be any relaxation of price control on new or used equipment. Dealers and those engaged in buying and selling used machinery and machine tools are still required to register with OPA under Licensing Order 3, and it will be necessary to maintain complete inventory and sales records.

In the past dealers and supply companies handling used oil field equipment and petroleum-refining machinery have been required to file sales reports on Form WPB 2574—OPA 2:10:P1. How industry maintains price control during this 90-day period will determine what action will be taken on future reporting requirements.

U. S. Field Operations

Oklahoma

Extension of West Edmond Pool Apparently Proven

Magnolia Petroleum Company's Talbot 1, C NW NW 28-13n-4w, Oklahoma County, apparently substantiates recent geological predictions that the West Edmond pool would extend in diminishing width into the middle part of township 12n-4w, as operator reported coring saturated Bois D'Arc from 6941 to 6987 feet. Oil string was set at 7102 feet for a test. The well would extend the pool about a mile south.

Production on the northeast flank of the pool in Logan County appeared defined as Cities Service Oil Company's Gaffney 1, C SE NE 29-15n-4w, missed the Hunton and drilled to 6980 feet in the Sylvan. It was plugged back for a test of the Bartlesville sand at 6424-53 feet. Phillips Petroleum Company completed Derr 1, SE SW 29-15n-4w, Logan County, flowing 620 barrels of oil an hour through 1-inch tubing choke from Bois D'Arc at 6780-6812 feet. Latest summary of operations in the pool reveal 51 locations, 30 derricks, 103 drilling, 166 producers and 11 dry holes. There are also four Bartlesville sand producers in the pool. The field runs average 29,000 barrels of oil daily, and completions were at the rate of a well a day in September.

Okfuskee County: Kubat & Phillips' Overall 1, SW SW NW 15-11n-9e, was completed as a Hunton lime producer after testing dry in the Wilcox. Lime zone was logged at 3853-3943 feet and 7-inch casing was cemented at 3984 feet. After perforating with 71 shots at 3898-3910 feet and treating with 2000 gallons of acid, the well flowed 490 barrels of oil and 250 barrels of water in 10 hours and then settled to 135 barrels of oil and 40 barrels of water daily through ¼-inch tubing choke. Oil is 43 gravity.

Lincoln County: Sinclair Prairie Oil Company's Danker 1, SE NW SE 28-14n-3e, wildcat 2½ miles south of Warwick, is shut in for pipe line connections. Final test flowed 50 barrels of 55-gravity oil in 20 minutes at a temperature of 90 degrees, indicating water proximity. Casing was perforated with 81 shots at 3475-98 feet and on initial test the well flowed 190 barrels of oil by heads in 24 hours.

Logan County: West of the Northeast Crescent pool, Kerlyn Oil Company's Green 1, SE NW 36-18n-4w, flowed 200 barrels of oil in 24 hours while cleaning out at 4840 feet. Liner has been set at 4717-4802 feet for production test. Phillips-Kerlyn's Dublin 1, NE NE 18-15n-4w, was drilling below 4800 feet.

Carter County: Continental Oil Company's Fowler 1, NW SE NW 31-2s-2w, apparently has opened a new producing zone in the old Graham pool. The well was drilled to 8250 feet and plugged back to the Viola, where it showed some gas. It was then plugged back and drilled to 5564 feet and perforated in the Hunton at 5410-50 feet, where a good oil show was reported as testing continued.

Garvin County: Sinclair Prairie Oil Company has a second producer in the pool opened east of the East Pauls Valley field. Allred 2, SE NW SE 20-3n-3e, south offset to the pool opener, was completing in the Bromide topped at 1883 feet. Wright 1, SE SW NE 20-3n-3e, north offset to the discovery well, looked like a failure after swabbing water in 7 hours on initial test when drilled out to 1896 feet. Operator has recemented for another test.

Beckham County: Phillips Petroleum Company is rigging up Nanee 1, SE SE NW 8-7n-25w, 9 miles southeast of Erick for a 2700-foot test of the Granite Wash. Location is on a large block which extends through townships 7n-24w and 8n-25w and a producer would revive play in Harmon and Greer counties. Bud Lewis last year drilled in 11-7n-25w to 2226 feet, topping Granite Wash at 1590 feet, where oil shows were reported. Other wildcats drilling in the area include Northern Ordnance, Inc.'s Crawford 1, C NW SE 25-9n-22w, drilling below 8000 feet and Sinclair Prairie's Perkins 1, C SE NW 11-9n-24w, drilling below 3775 feet with contract calling for a 6000-foot hole.

Washita County: Gulf Oil Corporation's Shields 1, SE NW SE 11-8n-20w, may be a new pool opener or ¾-mile extension to the West Sentinel field. Perforated with 234 shots at 6530-70 feet, the hole filled with 5900 feet of fluid, showed gas and later swabbed 65 barrels of oil and five barrels of water in four hours. California Company's Reeder 1, NE NW 31-8n-17w, was reaming at 8298 feet, preparing to run electrolog after reporting a show of oil at 4487 feet and bubbling gas in core at 8005-10 feet.

Missouri

The Tarkio pool of Atchison County continues its southward trend as Cities Service Oil Company completed another producer, Craigmile 1, NE NW SW 32-65n-39w, south offset to operators' Watkins 4, recent completion making 168 barrels of oil and about 80 barrels of water. With elevation at 1038 feet, oil string was set in Craigmile 1 at 1389 feet, shot with 8 quarts at 1391-95 feet and the hole filled with 680 feet of oil. Cities Service has staked Craigmile 2 in the C NWc SW 32-65n-39w. Cities Service's Watkins 6, C SW NW 32-65n-39w, east offset to Watkins 4, drilled to 1385 feet, set pipe at 1376 feet and was preparing to test.

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THEODORE R. AUDE, Stanolind Pipe Line Company, H. F. Brindell, superintendent, and D. O. Barrett, chief engineer for Gulf Oil Corporation, discussed slide rules of their own design before the Engineers Club of Tulsa October 2.

Wells Completed in the United States in Week Ended October 7

Data preliminary and subject to revision. Revised and more complete data on all completions shown in monthly summary of drilling, published in second issue of each month. More detailed data on wildcats published in third issue of each month.

State or District	FIELD COMPLETIONS: New Wells *Oil	Gas	†Input	Dry	Total	Old Wells Deepened	WILDCAT COMPLETIONS: *Oil	Gas	Dry	Total	ALL COMPLETIONS: This Week	Last Week	Cumulative: This Year	Last Year
Alabama	....	....	....	1	1	....	....	....	1	1	2	....	31	2
Arizona	....	....	....	....	....	....	....	....	....	....	....	....	6	4
Arkansas	2	....	....	....	2	1	....	....	....	....	3	7	175	198
California	43	1	....	....	44	....	1	....	2	3	47	46	1,590	1,088
Colorado	1	....	....	....	1	....	2	....	....	2	3	1	24	22
Florida	....	....	....	....	....	....	....	....	....	....	....	....	1	1
Georgia	....	....	....	....	....	....	....	....	....	....	....	....	6	2
Illinois	26	....	....	6	32	2	....	....	4	4	38	65	1,486	1,357
Indiana	5	....	....	3	8	....	1	....	5	6	14	10	250	206
Iowa	....	....	....	....	....	....	....	....	....	....	....	....	2	3
Kansas	22	3	1	....	26	1	2	1	8	11	38	21	1,333	1,288
Kentucky	10	....	....	8	18	....	....	....	3	3	21	17	595	287
Louisiana	6	....	....	5	11	....	....	....	....	....	11	19	583	485
North Louisiana	2	....	....	3	5	....	....	....	....	....	5	10	199	222
South Louisiana	4	....	....	2	6	....	....	....	....	....	6	9	384	263
Michigan	7	3	....	3	13	....	....	....	4	4	17	21	511	446
Mississippi	4	....	....	....	4	....	1	....	3	4	8	9	155	72
Missouri	1	....	....	....	1	....	....	....	....	....	1	1	36	22
Montana	10	....	....	3	13	....	....	1	5	6	19	....	274	168
Nebraska	1	....	....	....	1	....	....	....	....	....	1	....	8	36
New Mexico	4	....	....	3	7	....	1	....	2	3	10	1	306	203
New York	15	....	10	....	25	....	....	....	....	....	25	25	961	939
Ohio	5	3	....	1	9	....	....	....	....	....	9	6	691	644
Oklahoma	28	1	3	....	32	1	2	1	4	7	40	37	1,425	1,069
Pennsylvania	27	6	15	2	50	....	....	....	....	....	50	53	2,267	1,938
Tennessee	....	....	....	....	....	....	....	....	....	....	....	....	9	6
Texas	85	4	3	19	111	6	8	1	24	33	150	128	4,686	3,169
E.Tex.Bor. Co.'s	....	1	....	....	1	....	....	....	....	....	1	1	26	16
E. Texas Field	....	....	....	....	....	....	....	....	....	....	....	....	3	5
Rest of E. Texas	3	....	....	....	3	1	....	....	....	....	4	5	220	178
North Texas	7	....	3	9	19	4	2	....	3	5	28	40	1,087	771
W. Central Tex.	9	....	....	2	11	....	....	....	3	3	14	8	322	289
West Texas	39	....	....	3	42	1	1	....	6	7	50	26	1,236	700
Tex. Panhandle	8	....	....	....	8	....	....	....	1	1	9	11	182	151
G. Coast, Upper	8	2	....	1	11	....	2	....	4	6	17	17	451	246
G. Coast, Lower	6	....	....	3	9	....	3	1	3	7	16	7	731	485
Southwest Texas	5	1	....	1	7	....	....	....	1	1	8	12	346	282
S. Central Tex.	....	....	....	....	....	....	....	....	3	3	3	1	82	46
Utah	....	....	....	....	....	....	....	....	....	....	....	....	1	....
West Virginia	3	6	....	4	13	....	....	....	....	....	13	18	707	500
Wyoming	6	1	....	....	7	....	....	....	1	1	8	....	137	97
Total U. S.	311	28	32	58	429	11	18	4	66	88	528	485	18,256	14,252

* Includes distillate wells. † Includes salt water disposal wells.

Kansas

Ellis County Test Is Possible Pool Opener

Sunray Oil Corporation has a possible pool opener in Ellis County 2½ miles west of the Toulon pool. Younger 1-B, SE SE NE 6-14s-17w, set pipe at 3538 feet after topping Arbuckle at 3523 feet. Cores from 3525 to 3534 feet showed spotted saturation and after drilling cement plug and deepening to 3574 feet, the test bailed 2 barrels of oil an hour. It will be acidized.

ElDorado Refining Company's Gunther 1, NEc NW 9-11s-19w, wildcat 4 miles north of the Solomon pool, topped Lansing lime at 3357 feet. Four cores from 3390 to 3528 feet showed stains and saturation. With the exception of the northwest the test is surrounded with dry holes.

Graham County: Approximately 11 miles northwest of the Morel pool, Skelly Oil Company has a possible pool opener in Davis 1, NWc 15-7s-22w, which was preparing to test Arbuckle after setting pipe at 3856 feet, total depth. Arbuckle was topped at 3851 feet and good stains and porosity reported in cores at 3841-56 feet.

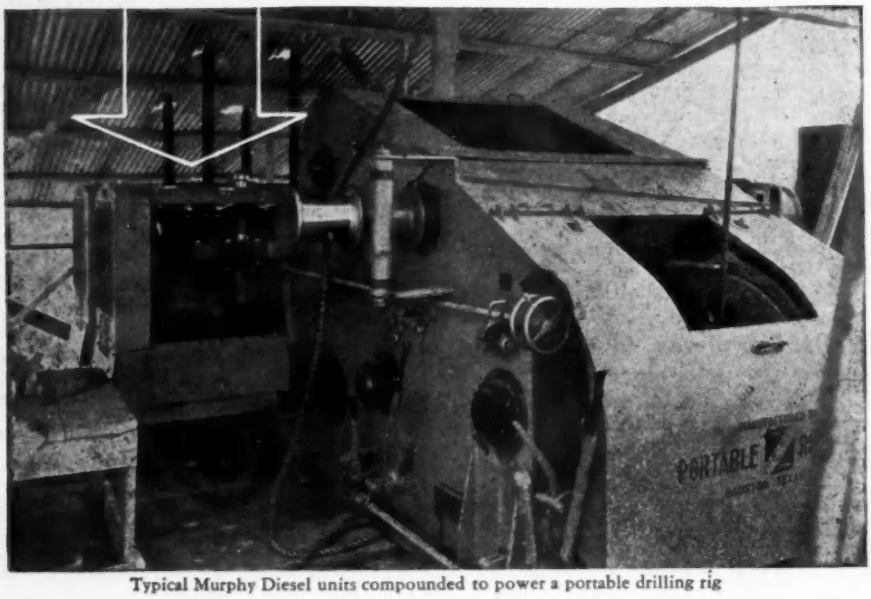
Rice County: Lauk & Moncrief's Sieverburg 1, NW SW SE 17-19s-10w, may be a mile northwest extension to the Bowman pool. Topping Arbuckle at 3332 feet, cores cut at 3337-49 feet showed porosity and saturation. Pipe has been set for production test.

Woodson County: In a county where oil and gas developments have been spotted and small, Rhinehardt & Donovan's Strockebrand 1, SEc 27-23s-15e, is being watched closely following a good oil show in the Squirrel sand at 1040 feet. The test was drilling below 1458 feet in the Mississippi lime.

Douglas County: J. M. Huber, Inc.'s Community 1, NW NW NW 33-12s-20e, east of the Lawrence pool, was drilling below 1707 feet. The wildcat developed about 10,000,000 feet of gas on drill-stem test at 345 feet and oil shows were reported in a core at 713-16 feet. Mississippi lime was topped at 1089 feet; Devonian at 1557 feet with oil shows reported at 1557-65 feet, and Viola at 1626 feet.

Rush County: Cities Service Oil Company's Urban 1, SWc NW 10-16s-17w, 7 miles west of the Wright pool, was drilling below 3303 feet. The wildcat reported porosity and oil stains in the Topeka zone at 3187-98 feet with formation topped at 3032 feet.

COMPACT POWER . . .



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New Mexico

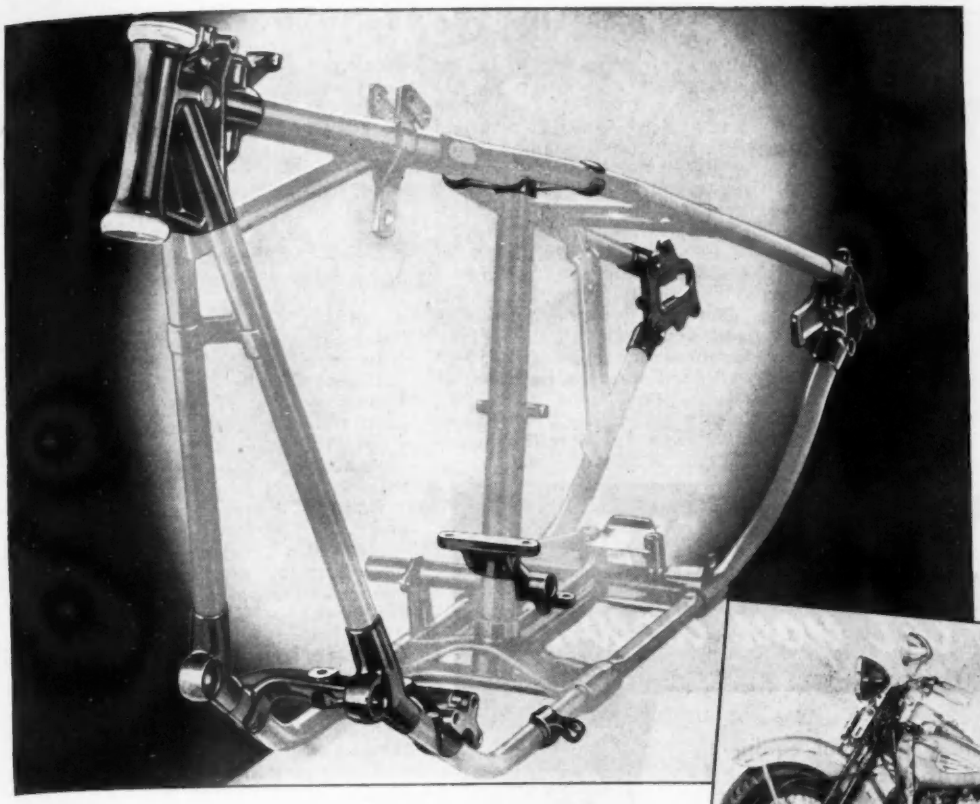
Two Lea Wildcats Flow On Preliminary Test

Development of flush production below the regular Permian and also from the Ellenburger in Lea County passed the speculative stage when 2 wildcats near the east border flowed on preliminary test and established new fields.

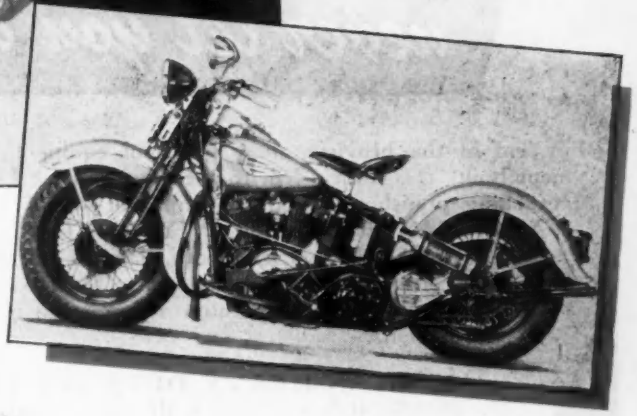
Gulf Oil Corporation's Vivian Drinkard 1, C NE NW 30-22s-38e, 2¼ miles east of the Penrose field and 2 miles east of the Andrews County, Texas, border, 25 to 35 barrels of 37.5-gravity oil hourly with gas volume rated at 330,000 feet daily when tester was used at 6365-6450 feet. Production is from the Wichita-Albany, or Clear Fork, which is receiving a major drilling program in the Fullerton field situated 15 miles to the east.

Ellenburger Strike: Humble Oil & Refining Company's Leonard-Federal 1, C SW SW 12-26s-37e, 8¾ miles north of the Kermit-Ellenburger field, Texas, strengthened its bid to become the state's first Ordovician producer besides being the deepest test in flowing at a rate of 77 barrels of 50-gravity sweet crude hourly with gas-oil ratio of 1660/1 when tester was used at 11,891-913 feet. Production is from Ellenburger, entered at 11,816 feet with elevation of 3012 feet. A successful completion was previously indicated when tester was used at 11,840 feet and 11,870 feet. The bottom-hole pressure was calculated at 5000 pounds during test at 11,913 feet. Additional pay was logged in progressing to 11,936 feet, affording 120 feet of probable effective pay to this depth, and an attempt may be made to drill through the zone before running pipe. Leonard-Federal 1 is more than 1000 feet deeper than Ellenburger wells in the West Texas sector of the basin, and is unusually low for the area.

Continental Oil Company et al's Skaggs 2-B-23, projected Ellenburger test between Monument and Skaggs fields, was drilling lime at 9930 feet, possibly in the Simpson. Some promise of production was passed up at 7695-7825 feet. Humble Oil & Refining Company's Keinath-Federal 1, 8-21s-38e, opposite the northwest corner of Andrews County, passed up a minor show of oil in Wichita-Albany (Clear Fork) at 7465-7524 feet, and was drilling lime at 8350 feet.



The famous Harley-Davidson Motorcycle. Phantom view of frame showing use of *drop forgings* at the points requiring maximum strength. . . . This model uses 29 drop forgings.



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West Texas

Prospective Strike Seen In Delaware Basin Sector

The Delaware Basin sector of West Texas offers a prospective strike through Lion Oil Refining Company's University 1-B, C NE NE Section 43, Block 17, having a good show of oil and gas after drilling 2 feet into the Delaware sand, topped at 4970 feet. The showing was through cased hole partly filled with water. The Delaware lime was entered at 4940 feet with elevation of 2655 feet. This wildcat is 85 to 100 feet high on the Delaware markers when correlated with an abandoned discovery pumper 2¾ miles southwest.

Andrews County: Stanolind Oil & Gas Company's University 1-D, pending discovery from several zones in the Lower Permian, confirmed additional pay in the Devonian, topped at 7965 feet, when drill-stem test at 8289-8350 feet returned gas to surface in 9 minutes and yielded 1440 feet of fluid, averaging 60 percent free oil. Previous drill-stem test at 8144-8251 feet revealed natural flow of 40-gravity oil. The Devonian has accounted for a flush producer to the north in the Fullerton field. Champlin Refining Company's University 1-B, 1¼ miles northwest, cemented pipe on bottom at 8536 feet, and first perforations will be opposite Devonian saturation at 8450-90 feet, with production virtually assured in the 7100-foot zone.

Gaines County: Humble Oil & Refining Company's Doss 1, 3½ miles northwest of the Robertson 5900-foot 1-well pool, apparently eliminated the Clear Fork as a source of production in testing salty sulphur water from perforations at 7030-7233 feet. This wildcat was drilled to 9049 feet. Amerada Petroleum Corporation's Jones 1, 3¼ miles southwest of Clear Fork production in the Wasson field, was drilling at 7770 feet with occasional streaks of porosity, but lacking effective pay.

Wildcat Failures: Northern Ordnance, Inc.'s Clayton-Johnson 1, Borden County, tested sulphur water in Ellenburger at 9450-99 feet. In Lynn County, The Texas Company's Tunnell 1 recovered water in Clear Fork at 6530-6690 feet.

Emma Field: The Texas Company's University-Magnolia 1-L, 1⅛ miles east of production, recovered sulphur water from Holt lime perforations at 5350-70 feet, and was plugged back to 5338 feet to reperforate.

Ector County: Shell Oil Company and Cities Service Oil Company's T.P. Land Trust 1, Ellenburger prospect that passed up oil production in Basil Permian and Devonian, was drilling lime at 8750 feet.

Correction

Phil J. Lenhard, of United Geophysical Company, Pasadena, California, is in Venezuela making a research study of various service activities in connection with completion of wells and production of oil in the fields of Venezuela. A statement in THE OIL WEEKLY, September 11 issue, that the research was being done for the Venezuelan government, was in error. A. H. Chapman of United Geophysical, advises that Lenhard's work has no official status whatever with the government of Venezuela, that "United Engineering and United Geophysical are making a research study at the present time of various service activities to which we might devote our attention in the Caribbean area."

Borneo Refinery Bombed

The 300,000-barrel refinery at Pandansari, Balikpapan, on Borneo, was hit with more than 40 bombs last week. Described by General MacArthur as "The most lucrative, strategic target in the Pacific," the plant was badly damaged by the raid. The refinery area was said to have been swept by fire from the attack. This plant is one of the principal sources of aviation gasoline for the Japs.

M. M. WARDEN, in the sales department of the Hughes Tool Company, Houston, for eight years, the past four as branch manager in Michigan, has resigned to join the sales department of the Utility and Industrial Supply Company and the H. L. Gentry Engineering Company, Jackson, Michigan.

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BE SURE TO CHECK . . . .
Trading Post Section
ON PAGE 83 OF THIS ISSUE

Because of the scarcity of certain types of new equipment and the fact that some operators may have a surplus of some items and a serious shortage of others, this **Used Equipment Forum** is performing a valuable service to operators in locating needed used materials or disposing of surpluses that may be needed by others.

North Texas

Completion of Wilbarger Wildcat to Be Attempted

Failn & McGaha's Martin 1, SE SE NW H&TC Ry. 5, Block 11, Wilbarger County, wildcat 3 miles north by west of the Fargo multi-pay field, will set pipe to try for completion in Strawn lime at 4765-4803 feet. This wildcat made a drill-stem test when bottomed at 4776 feet, returning a fair gas blow to surface in 13 minutes and recovered 150 feet of oil and 115 feet of oil- and gas-cut mud.

Cooke County: The Texas Company's Rasure 1, Sivels Bend prospect, tested water with a small show of oil from perforations at 6755-63 feet in the Strawn. The company's Lynch 1, 3 miles southwest of the Big Indian 1-well pool, swabbed 8 barrels of salt water hourly on preliminary test from Strawn perforations at 4665-76 feet.

Archer County: Phillips Petroleum Company's Bullington 1, Mathew Doyle survey, on the west side of the Browning sector of the Vogtsberger field, was drilling at 6290 feet in the Ellenburger, topped at 5233 feet. The company proposes to proceed to the Cambrian, which has been rarely tested in the district where normal thickness of Ellenburger prevails.

Montague County: Continental Oil Company's McNutt 1, 2½ miles southwest of Bowie, eliminated the Lower Simpson as a source of production in filling 7100 feet with salt water from perforations at 6992-7010 feet. Gulf Oil Corporation's Ferguson 1-E, wildcat on strike between the Nocona deep area and Ringgold multi-pay field, was abandoned with water in Ellenburger at 5974-6125 feet.

Grayson County: The Pure Oil Company's Little 1-A, 1½ miles southwest of Gordonville, was drilling shale with sand streaks at 7150 feet on 11,000-foot depth contract.

East Texas

Lone Star Test Fails to Make Commercial Well

Skelly Oil Company's Chisum 3, southeast of the company's sand flat field discovery, Smith County, flowed 9 barrels of oil hourly natural through 3/16-inch choke from Paluxy perforations at 7080-7110 feet. This well made unsuccessful exploration of the Rodessa and Pettit zones in drilling to 9451 feet. Skelly's Chisum 4 will be drilled 1500 feet north of the discovery.

Hopkins County: Humble Oil & Refining Company's Nichols 1, prospective oil strike in the Rodessa, was attempting to recover drill pipe while bottomed in Travis Peak at 8567 feet. Sun Oil Company's Turner 1, outpost, was drilling at 3250 feet with protection string of 9-inch at 2651 feet.

Wildcats: H. C. Owens et al's Rousseay 1, Rusk County Travis Peak prospect 4½ miles northeast of Minden, was idle at 7224 feet after temporarily passing up about 15 feet of porous section in Pettit, topped at 6993 feet with elevation of 595 feet. In Wood County, Sinclair Prairie Oil Company's Collins 1, northwest of the Hawkins dome, was drilling shaly lime at 6522 feet, having entered the Georgetown at 6096 feet.

Camp County: Gulf Oil Corporation's Ferndale Club 1, first of a group of wells schedued in the Pittsburg by directional method to avoid spotting rig in lake, pumped 86 barrels initial from Pittsburg sand perforations at 7874-7980 feet. Vertical hole was drilled to 4111 feet.

Cherokee County: W. H. Foster and Phillips Petroleum Company's Bowling-Pure 1, initial deep exploration for the Lone Star pool, was awaiting orders after testing a small volume of high-gravity green oil and no water from Rodessa perforations at 7340-64 and 7376-88 feet. Contractor's rig was released. Further testing of the Rodessa is scheduled, and it is considered possible that a small pumper can be gained by making additional perforations then reacidize. The Pettit, carrying salt water, was entered at 7928 feet and Travis Peak at 8278-8370 feet.

Humble Oil & Refining Company's Stanley 1, third test for the Larissa 1-well pool, was drilling shaley-lime at 8280 feet, checking flat with the discovery.

Van Zandt County: Northern Ordnance, Inc.'s Shelton 1, Leander Smith Survey 1½ miles southeast of Martins Mill, will set pipe with hole bottomed in Travis Peak at 9200 feet. Electrical formation survey indicated production possibilities in Rodessa porosity at 8285-91 and 8455-66 feet, while porous Pettit at 8884-94 and 8933-47 feet will also be tested. Humble Oil & Refining Company's Bruce 1, 4 miles south of Edgewood, was drilling at 8195 feet in sandy-shale on Travis Peak contract.

Arkansas Louisiana Gas Company's Hudson 1, Isabella Hanks Survey, 1½ miles south of production on the southwest side of the Carthage field, Panola County, was preparing to test the Pettit zone. Drill-stem test of the Travis Peak from 6390-6400 feet indicated 2,000,000 feet of gas, total depth 6340 feet.

Shelby County: Ce-Beth Oil Company's Smith 1, H. McKelvey Survey, plugged at 6950 feet, logged some porosity in the Travis Peak and Pettit sections, but failed to show commercially.

Harrison County: Roger Lacy's Verhalen Nursery Company 1, Aaron Poe Survey, deep wildcat in Scottsville, 8 miles east of Marshall, was abandoned at 6700 feet. A core cut at 5552 feet in the Lower Glenrose recovered 4 feet of lime with slight oil stain and odor but with formation water indicated.

Angelina County: Humble Oil & Refining Company has cemented surface casing at Angelina Lumber Company 1, W. H. Herring Survey, 10 miles west and north of Lufkin, first deep test for the Rockland area of the country.

Michigan, Arkansas and Wyoming Maps Available

Possibilities of oil production in several additional areas in Wyoming, Michigan and Arkansas are shown in maps prepared by the Geological Survey.

Four anticlines along the northern side of the Wind River Basin, Wyoming, may yield additional oil from deeper horizons that have not yet been tested, it is indicated by a "Geologic and structure contour map of the Maverick Springs area, Fremont County" (40 cents).

A map on the "geology and oil and gas possibilities of south-central Michigan" (25 cents) covers areas not yet explored, and a "geologic map and structure sections of the Batesville district, Independence County, Arkansas," (40 cents) shows the geologic formations exposed in an area of almost 60 square miles lying both north and south of the White River.

The Survey also has completed a new geologic and topographic map of the asphaltic limestone deposits near Dougherty, Murray County, Oklahoma, which is available at 25 cents a copy.

Second Bammel Receiver

In another suit involving the Bammel field, Harris County, filed last week, the attorney general of Texas asked for a receiver for a portion of the properties in the field owned by H. M. Harrell. The court had appointed a receiver previously for the F. M. Corzelius properties. It appeared that the move was taken as a means of gaining cooperation of all the operators. The case was set for hearing on October 13, but a temporary injunction which was issued requires Harrell to continue pumping mud into the Corzelius well.

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CLAUDE C. DUFFEY, 66, Midland, Texas, operator, died September 28 at San Antonio following lengthy illness.

Southwest Texas

New Location Made Near West Sinton Discovery

Tide Water Associated Oil Company has made location in the West Sinton area, San Patricio County, where the company recently opened oil production at 3390 feet. The new well is the P. E. Dyer 1, on a 21.54-acre lease in the M. J. de la Garza survey and is scheduled to go to 6500 feet for a test of the deeper sands. The discovery well, Gerdes 1, was completed ½ mile northwest of Sinton and ¼ mile northwest of the new location, in perforations at 3394-96 feet where it flowed at the rate of 42 barrels of 25-gravity oil daily through ¼-inch and 5/64-inch chokes on a drill-stem test. It had originally drilled to 6995 feet, but set the casing at 3513 feet for tests of this shallow sand.

Goliad County: Amerada Petroleum Corporation's Ada G. McFadden 1, wildcat 12 miles west of Goliad and 3 miles southeast of the shallow Hordes Creek field, is preparing to make another test after having recovered oil and some water on a drill-stem test with casing perforated at 8930-56 feet. Using ¼-inch choke, it flowed 81 barrels of 36.7-gravity oil and 35 barrels of mud and water before being closed in. Working pressure was 3750 pounds.

Bee County: Magnolia Petroleum Company is coring at 7048 feet in its W. E. Erp 1 after recovering oil on a drill-stem test. It is 9 miles west of Pettus, and the test was made at 6979-82 feet.

Karnes County: Phillips Petroleum Company has added a producer in the Runge field with its Mrs. N. J. Lyons 1, ¼ mile south of production, flowing 144.88 barrels of 39.4-gravity oil daily through a ¼-inch choke with tubing

pressure 1575 pounds. Total depth is 7880 feet, but it was plugged back to 6660 feet and perforated for completion at 5691-96 feet.

H. R. Smith & W. C. McBride's McCaskill 1, wildcat in the Porter area, made a drill-stem test at 7427-35 feet, recovering 30 feet of oil and 450 feet of water in 15 minutes, and is coring below 7560 feet. It had shown gas on tests higher in the same sand.

Nueces County: L. M. Lockhart's Cheeves 1, 2 miles north of Banquette, showed gas and condensate on a drill-stem test with casing perforated at 5168-82 feet, showing working pressure of 1150 pounds, but recovered only a little fresh water in the drill stem. It was testing at latest report through perforations at 5450-62 feet, and is said to be showing more gas and distillate. Meanwhile Lockhart has made location for Ada Wright 1, another test in the same area, 4000 feet northeasterly from the Cheeves 1, with announced intention to drill to 5500 feet.

Texas Gulf Coast

Wharton County Production Located in Lower Frio Sand

Amerada Petroleum Corporation's Charles J. P. Daboval 1, 8 miles southwest of El Campo, is opening a Wharton County oil field, although still testing with final gauge yet to come. Production is from the lower Frio sand and casing was perforated at 7025-27 feet. On latest gauge it was being tested through a 6/64-inch choke and was flowing pipe line oil at the rate of 47 barrels daily, with tubing pressure 2100 pounds. Gravity of the oil was 45.5 degrees. On a previous test, with casing perforated at 7025-28 feet, it made some oil and salt water and squeezed perforations before making the latest test. Total depth is 7430 feet with 5½-inch casing at 7145 feet.

Sam G. Harrison's Schulze 1, another Wharton County wildcat, 10 miles south of Hillje, was cemented after setting a string of casing at 5490 feet. Casing was set after drilling to contract depth 6500 feet and running electric log. Showings to be tested are in the Frio.

Matagorda County: Skelly Oil Company's Granbury-Fullilove Unit 1, wildcat 3 miles northeast of Van Vleck in the Amos Rawls league, is setting casing now for tests of several sands in the Frio section. It was drilled to 10,010 feet, but casing will not be run to bottom of the hole.

Skelly has made location for its G. P. Hardy 1, wildcat a mile east of the Bay City townsite in the Henry Goslin Survey, 1140 feet from the west and 630 feet from south lines of a 131-acre lease. Contract depth is 10,000 feet.

Washington County: Magnolia Petroleum Company's Herman Lauter 1, drilled to 8022 feet as the deepest well on the Clay Creek dome, has made a number of tests, deepest being with casing perforated at 6262-66 feet, and has come up the hole to complete in perforations at 4606-11 feet. On preliminary tests at this level it swabbed at the rate of 4 barrels of 35-gravity oil hourly and is awaiting installation of pumping equipment to complete. It will open a new sand for this old dome.

Austin County: Phillips Petroleum Company has made location for its George Ponykal A-1, as a deep test on the south flank of the Brenham Dome in northern Austin and southern Washington Counties. This well is scheduled to 8500 feet for a test of formations on the flank of this old piercement-type salt dome, and is another in a series of flank tests along this trend being drilled by both Phillips and Magnolia.

Jefferson County: Sun Oil Company has made location for its J. W. Mackie et al, on the north side of the Nome field which will be the first development in this field for some time.

Shell Oil Company has announced location for a wildcat in the Port Acres area in the southeast part of the county, 6 miles west of Port Arthur.

South Louisiana

New Oil Field Located in Jefferson Davis Parish

Barnsdall Oil Company, Vincent & Welch, & George McGhee's Miller 1, on the West Tepetate prospect, has opened an oil field for Jefferson Davis Parish, although final gauge is still to be made. On latest test it flowed 32 barrels of 34.8-gravity oil an hour through a ¼-inch choke with tubing pressure 1350 pounds, but had to be closed in for storage.

The field is 2 miles west of the Tepetate producing area and the oil is coming from the equivalent of the Ortego sand, with casing perforated at 8516-26 feet. This sand was found at 8512-28 feet, and the well was plugged back from total depth of 10,032 to 8528 feet. After perforating, a drill-stem test was taken during which the flow was gauged at 222 barrels in 7 hours and 20 minutes through ¼-inch choke with working pressure 1475 pounds and gas-oil ratio 1030 to 1.

Continental Oil Company's King Corporation 1, also expected to open a producing area in Jefferson Davis Parish, has been delayed in its test, but has now perforated casing at 7125-35 feet with 30 shots and is being brought in. Sand had been found at 7780 feet while drilling to 9302 feet, but the upper sand is being tested first.

Acadia Parish: Union Sulphur Company's Gueno 3, Branch area, has its series of tests at 11,085-090 feet under way and is testing through various chokes under high pressures. It is flowing 260 barrels of 45-gravity oil daily through a 10/64-inch choke with tubing pressure 6400 pounds and showing gas-oil ratio of 11,000/1.

Phillips Petroleum Company's Onezime 1, outpost 1½ miles northwest of the South Crowley field, is being tested through perforations at 7738-41 feet, making mostly gas at latest report, and may receive a new-field designation. It had drilled to 10,020 feet before coming back up the hole to complete.

Calcasieu Parish: Continental Oil Company is making tests in two important wells south of Lake Charles. Its Glen Greathouse 1, South Lake Charles prospect, is being perforated in the upper 8 feet of a 12-foot sand at 10,900 feet.

Continental's Prairie Land Canal Company's A-1, East Moss Lake area, is being completed from the same sand producing in the discovery well, found between 10,400 and 10,500 feet. It has started swabbing at latest report.

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North Louisiana

Efforts Made to Subdue Two North Louisiana Gas Wells

Efforts were being made to subdue 2 gas wells in North Louisiana. In DeSoto Parish, G. C. Shoomaker and A. A. Phillips' Anthony 1, Section 9-11-14w, 6 miles southwest of Mansfield, which caught fire a week ago, was reported spreading. The gasser was completed six weeks ago for an estimated 125,000,000 feet daily and had been shut in. Shots into the well from anti-tank guns brought from Camp Polk failed to extinguish the blaze.

Caldwell Parish: Debris is being cleaned up around Shell Oil Company's Louisiana Central Lumber Company 1, NW 31-15n-3e, but efforts to kill the flow of gas have not been successful. The well blew out a week ago, demolishing the derrick, while fishing at total depth of 10,141 feet. The well indicates a capacity gasser, and may be producing anywhere from 6514 feet to total depth, as a string of 9⅝-inch casing was cemented at the upper level for protective purposes.

Red River Parish: The Texas Company was drilling at 5305 feet in Semp Russ 1, 16-12n-10w. In a 10-minute drill-stem test from 5010-33 feet, the well showed gas estimated between 1 and 5 million feet daily with spray of distillate and recovered 48 feet of gas-cut mud. Bottom-hole pressure was 2675 pounds.

Bossier Parish: Barnsdall Oil Company will perforate casing from 8155-65 feet and 8113-50 feet, run a squeeze job, and then perforate opposite sand from 8100-10 feet for test at J. T. Hanks 1, NW SE 7-20n-12w. Total depth is 8765 feet in shale with string of 7-inch cemented on bottom.

Webster Parish: Hunt Oil Company recovered 60 feet of drilling mud cut with was and oil on a 17-minute drill-stem test of Mrs. O. G. Roberts 1, 11-23n-10w, from perforations at 5713-65 feet. The well is drilling below 5834 feet, with production being sought to 9500 feet.

Lincoln Parish: The California Company's Jessie Mae Norris 1, C NW NE 15-18n-1w, is ripping casing. No commercial production is indicated though the well was considered a good prospect for gas or gas-distillate.

Southwest Gas Producing Company abandoned V. V. Colvin Heirs 1, 7-19n-2w, in Travis Peak at 6100 feet. After running electrical survey the well was plugged back to 5280 feet and cement drilled out to 5368 feet. On a 30-minute drill-stem test at 5140-5368 feet, it showed a slight blow at the surface and recovered 1600 feet of drilling mud, but had no shows in the Pettit.

Claiborne Parish: Hassie Hunt, Trustee, has completed Hunt 1, 9-21n-4w, in the Lisbon field for 245 barrels of distillate and 35,000,000 cubic feet of gas per day through ¾-inch choke on tubing. Perforaitons were made from 7696-7712 feet and 7690-7710 feet with total depth of 7750 feet.

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LAWRENCE W. HEWITT is in charge of Sunray Oil Corporation's Houston office, and Sherill A. Shannon has been assigned to Sunray's office in Wichita, Kansas.

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Arkansas

Second Well in Salem Church Field Is Tested

McAlester Fuel Company's Wilson-McRae 1, C NW SE SW 28-16s-18w, in the Salem Church field, Union County, yielded a core from 7050-67 feet which showed 13 feet of porous oolitic lime with odor of gas. A string of 5½-inch casing was cemented at 7067 feet. A 6-minute drill-stem test recovered 30 stands of gas-cut mud with no formation water, tool having cleaned itself as it was being pulled. The well topped the Buckner at 6730 feet, about 10 feet higher than Carter's Wilson 1, discovery well ¾ mile southwest. Top of Smackover was picked at 6960 feet, 53 feet lower than the discovery. This well will decide the spacing and pattern of future wells drilled in the field.

Phillips Petroleum Company is moving material for Callie 1, 30-18s-12w, proposed Smackover test in the Strong area.

J. R. Lockhart's Armor 1, SW NW 32-16s-14w, will be plugged at 5900 feet.

Pope County: Stanolind Oil & Gas Company was drilling below 3850 feet in G. B. Maxwell 1, C SE SE 18-8n-18w, wildcat.

Johnson County: Arkansas-Louisiana Gas Company's S. M. Hudson 1, C NE 15-10n-24w, in the Clarksville field, is drilling below 5685 feet in lime after running electrical survey. Wilcox was logged at 5170 feet. The well will be taken to the Arbuckle lime.

Ouachita County: Grady Vaughn will drill J. F. Haltom 2, NWc NE SE 28-15s-18w, 4000-foot Nacatoch test in the same 40-acre tract as the Haltom 1, which is awaiting standard rig to test gas shows in the Nacatoch from 1905-50 feet. Seven-inch casing was set at 1954-3700 feet, plugged back depth, total depth, 6264 feet.

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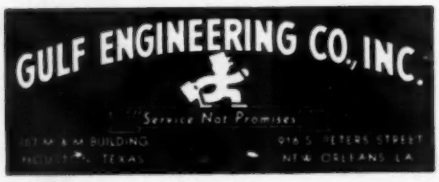

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Southeastern

Two Sands Showing Oil, Gas Noted in Mississippi Test

The Pure Oil Company's McDowell 2, wildcat southwest of the Cranfield field, Adams County, has made a squeeze job in perforations at 10,310-321 feet after showing salt water on a drill-stem test of the lower formation. This well has casing set at 10,290 feet, with liner to bottom of the hole at 10,330 feet. Two sands showing gas and oil were noted, one at 10,270-293 feet, which tested 3,000,000 cubic feet of gas and some condensate on a drill-stem test. The other sand is at 10,305-328 feet. Both have water in the bottom, and have rather exacting squeeze jobs to be done before final completion.

Humble Oil & Refining Company's Ada Stowers A-1, in Section 9-8n-2w, northwest of the Cranfield field and northeast of Natchez, is drilling below 9500 feet for a test of the Tuscaloosa.

Warren County: Sinclair-Wyoming Oil Company is preparing to start Mary G. Blake 1, a wildcat in Warren County, on the northwest flank of the King salt dome and in the northwest quarter of 7-17n-4e. Magnolia Petroleum Company's H. D. Ragsdale, wildcat 6 miles east of Vicksburg, was drilling below 8349 feet in shale.

Lamar County: Gulf Refining Company's C. V. Cooper 1, expected to open an oil field near Baxterville, is coring below 8119 feet in black, sandy shale with no new showings reported. Showings from 7736 on down to 7884 feet, are said to be in Eagleford instead of Eutaw, and the only test taken below that was at 7987-8065 feet, which showed salt water with a slight show of oil and gas.

Hinds County: J. V. Canterbury is rigging up J. R. Ball 1, 7 miles westerly from Jackson in 7-5n-1w. Scheduled to go to 7000 feet for a Tuscaloosa test, it is being supported by several of the larger companies including Stanolind Oil & Gas Company, Magnolia Petroleum Company, Union Oil Company of California, Sun Oil Company, and Woodley Petroleum Company.

Florida

Florida's deepest test, Humble Oil & Refining Company's Gulf Coast Realties 2, C SW SE 30-48s-30e wildcat in Collier County, was abandoned at 13,512 feet in lime. Crews were unable to recover 76 feet of drill pipe lost at that depth. Humble will move the rig to Gulf Coast Realties 4, 20-48s-30e, another wildcat in Collier County.

Alabama

Humble Oil & Refining Company's J. R. Williams et al B-1, C SW NW 20-6n-4w, wildcat in Washington County, halted for a fishing job at 5737 feet in shale.

Hunt Oil Company is drilling below 5181 feet in Harry B. Jones 1, C SE SE 3-1n-11e, Escambia County wildcat.

California

Coles Levee Test Sets Depth Mark for State

Standard Oil Company's K.C.L. 20-13, Section 5-31-25, deep test of the Coles Levee field, has established a new depth record for California and is drilling at 15,027 feet in hard shale. The well will be an Eocene test. Progress has been slow due to two factors; the hard formation and the time required—8 hours per round trip—to change bit going in and out of the hole.

A field was opened up by Rothschild-Bender with the completion of Shee Springs 2 in SE SE 17-29-21, south of the Belridge field, Kern County, flowing at a 600-barrel-per-day rate, 25-gravity clean oil from the Carnerous Silt. Depth is 3487 feet with casing cemented at 3450 feet.

Fresno County: Three failures were registered: The Texas Company's Hawxhurst 11-16, NW NW 6-22-16 in the Jacalitos area, found the Vaqueros dry and was abandoned at 4857 feet; General Petroleum Corporation-Cryan 1-32 in 32-16-19 found all zones wet and was abandoned at 8174 feet; and Superior Oil Company-San Joaquin 88-32 in 32-15-17 was abandoned at 7310 feet in gray sand.

Kern County: Harry H. Magee, Operator-Amalgamated-Happold 2 in 15-25-24, has cored Vedder showings and is running casing to test.

Los Angeles County: Shell Oil Company, Inc.'s Puente B-1 in the Brea field is producing 560 barrels per day, 24.0-gravity, 3 cut from a depth of 5080 feet with shut-off at 1890 feet, a total of 3190 feet of producing formation.

A second well north of the Seal Beach fault is Standard Oil Company's San Gabriel 29, which flowed 2400 barrels per day on a drill-stem test from the heretofore unproductive Selover zone and has cemented casing preparatory to completing.

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D. E. FIELDS, Tulsa Boiler & Machinery Company, has succeeded John H. Keyes as chairman of the executive committee of the Mid-Continent Section, A.S.M.E.

Rocky Mountain Area

Park County, Wyoming, Test Plugged Back to Tensleep

Husky Refining Company's test of the Half Moon structure, Park County, Wyoming, Krampert-Unit 1 NE SW NW 23-51n-102w, drilled to 4265 feet and was plugged back to 3665 feet for test of the Tensleep.

The Tensleep was perforated at 3551-3556 and 3560-3571 feet and tested water. Cement retainer was set at 3512 feet and the casing perforated with 72 holes opposite the Embar at 3425-3455 feet. The well swabbed 4 barrels of oil per hour and after treatment with 550 gallons of acid, swabbed at the rate of 35 barrels per hour.

Crooked Creek: The Carter Oil Company's N. P. 1, C SW SE 15-4n-26e, on the Crooked Creek structure, Yellowstone County, Montana, was abandoned at 6590 feet. The Madison was topped at 6390 feet and the Amsden at 5653 feet. Ground elevation at the well site, 3592 feet.

Rangely Field: Completion of the Wasatch Production Company's deep test McLaughlin 1, NW NW NE 32-2n-102w, Rangely Field, Rio Blanco County, northwestern Colorado, extended productive limits of the Weber sand a mile southeast. The well was drilled to 6236 feet and in the first 14-hour period flowed at the rate of 17 barrels per hour through a ¼-inch tubing choke.

Illinois Basin

Outpost in Mattoon Area Producing from Rosiclare

Carroll et al's George Rudy 1, SWc 24-12n-7e, outpost in the Mattoon area, Coles County, is cleaning out and making about 50 barrels of oil every 12 hours from Rosiclare sand at 1978-84 feet. The well was given a 20-quart shot.

Edwards County: Rock Island Refrigerating Company's Chalcraft 1, NW SE NW 12-3s-10e, has set casing for a test of Renault sand at 3022 feet.

Douglas County: Ohio Oil Company's Shaw 1, SW SW SW 36-16n-8e, wildcat near Tuscola, is drilling below 3200 feet on a proposed 6000-foot test. In rank wildcat territory the well is located on a block of nearly 10,000 acres of land taken by Ohio after the area was recommended by the Illinois Geological Survey because of the position on the La-Salle anticline.

Richland County: Phillips Petroleum Company's Richland 1, NE SE SE 6-2n-10e, discovery 6 miles southwest of Olney, during a 24-hour test flowed 628 barrels of oil natural from McClosky lime at 3150-59 feet.

Marion County: Skelly Oil Company's Wilson 1, SE SE NW 36-1n-4e, wildcat 15 miles north of Mt. Vernon, is drilling below 2500 feet. Upper Glen Dean was topped at 2243 feet.

Kentucky

Shell Oil Company's Hamilton 1, 14-0-27, 4 miles south of the Birk City pool, made 40 barrels of oil in 24 hours from Cypress sand at 1835-45 feet to open the Curdsville pool.

Kentucky's operations dropped two this month, sliding to 118 compared with 120 last month.

Fourteen producers were completed in Indiana during September with a yield of 662 barrels of oil. For the year the state has had 105 oil wells, 106 dry holes and 12 gas wells completed.

Michigan

Bay County Well Shut in; Site Cleared for Offset

Delay in setting stock tanks and completing a flow hook-up kept Shell Oil Company's Koth 1, SW NE NW 2-16n-4e, Bay County, shut in since the first flow test 10 days ago. It flowed 150 barrels of 36.7-gravity oil in 3 hours through 5-3/16-inch casing after a single half-inch shot perforation at 2900 feet. Shell has cleared location 1320 feet north for an offset.

Ogemaw County: Muskegon Developmen Company's State B1, NW SE NW 19-24n-2e, showed 1100 feet of oil natural in Richfield lime at 4152 feet and will be acidized. It is 1¼ mile northwest of Rose City pool producers.

Montcalm County: Rowmor Corporation's Linder 1, NW SW NW 33-9n-5w, ¾ mile northeast of Bloomer pool discovery, logged Traverse at 2654 feet, structurally low, and showed water at 2675 feet. It may be deepened to test Dundee.

WESTERN CANADA

Initial Deep Test Started In Calling Valley Area

Royalite Oil Company has started its initial deep test in the New Valley or Calling Valley area, flanking the north part of the Turner Valley oilfield to the east. The venture, Royalite-New Valley 1, is to be drilled in lsd 2 22-21-3w5th. Completion depth in the Madison limestone is expected at 10,000 feet or deeper.

The area to be tested was discussed in THE OIL WEEKLY (June 26, 1944) by Dr. G. S. Hume, Canadian Oil Controller geologist. Dr. Hume believes the source of Turner Valley oil and gas lies to the east of that field; that, theoretically, a fold should develop at or near the eastern edge of the fault block limiting Turner Valley in that direction; and that "it is this assumed fold, and perhaps others east of it, that seem to offer some of the best prospects in Alberta for the occurrence of oil in an area where the strata are known to have been copiously oil-bearing to provide the oil and gas in such a field as Turner Valley."

Imperial Oil has started another South Alberta Plains wildcat, Imperial-Raymond 1, in lsd 7 16-6-20w4th, a mile east of Raymond and 28 miles southwest of the Taber oil area.

For the American Victory

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U. S. Exploratory Completions

ALABAMA WILDCAT

Lauderdale County—Failure: J. L. James' Jeanette Simpson 1, c ne se nw 33-1s-5w, abnd 500 ft.

CALIFORNIA WILDCATS

Fresno County—Failure: Texas Co.'s Hawxhurst 11-6, nw nw 6-22-16, abnd 4857 ft.

Kern County — Oil Discovery: Rothschild-Bender's Sheep Springs 2, se se 17-29-21, flowed 600 bbls 25-gr fr Carnerous 3450-87 ft, td 3487 ft.

Los Angeles County—Failure: Standard Oil Co.'s Lomita-Sunset 1, ne nw 29-5-11, abnd 5803 ft.

COLORADO OUTPOSTS

Rio Blanco County—Rangely Field Extension: Wasatch Prod. Co.'s McLaughlin 1, nw nw ne 32-2n-102w, flow 238 bbls in 14 hrs, 408 bbls day, Weber sd, td 6236 ft.

Jackson County—McCallum Field Extension: Continental's Pollock B-2, c se ne 3-9n-79w, ne of prod, flow 103 bbls oil 11 hrs, 5,775,000 gas, Lakota sd 4988 ft, td 5085 ft.

ILLINOIS WILDCATS

Edwards County—Failure: Phillips' Colyer 1, ne ne sw 9-1s-10e, abnd 3396 ft.

Hamilton County—Failure: Indiana Farm Bureau's Seymour 1, nw nw ne 33-6s-7e, abnd 3356 ft.

Jefferson County—Failure: H. S. Williams' Piercy 1, se sw se 6-2s-2e, abnd 2362 ft.

Wayne County — Failure: Amisco, Inc.'s Smuffin 1, ne nw se 21-1s-7e, abnd 3369 ft.

INDIANA WILDCATS

Gibson County—Failures: White Eagle Oil's Deep Vein Coal Co. 1, ne nw se 25-1s-12w, abnd 2400 ft.

L. J. Lloyd's Knowles 1, se se nw 32-2s-11w, abnd 2454 ft.

Texas Co.'s Fed. Farm Mortgage 1, nw nw nw 33-3s-9w, abnd 2082 ft.

Grant County—Oil Discovery: J. C. Reynolds' Knight 1, ne ne sw 8-23n-8e, pump 5 bbls, Trenton 997-1044 ft, td 1044 ft.

Posey County—Failure: Sun's Kemmerling 1, se se ne 31-4s-13w, abnd 2985 ft.

Wabash County — Failure: Texas Co.'s Schultz 1, nw nw se 24-28n-6e, abnd 1068 ft.

KANSAS WILDCATS

Barber County — Gas Discovery: J. M. Huber's Gant 1, c nw 32-30s-13w, flow 38,714,000 gas, perf 23 shots 4534-4621 ft, 1000 gals acid Dolo 4560 ft, td 4621 ft.

Ellis County—Oil Discovery: Sunray's Orth 1, ne ne sw 2-14s-20w, pump 563 bbls 37.6-gr, perf 48 shots 3835-43 ft.

Ellsworth County—Failure: Atlantic et al's Roth 1, nw sw se 9-17s-10w, Lans 2984 ft, Arb 3350 ft, abnd 3400 ft.

Osage County—Failure: Ray Anderson et al's Woodward 1, se sw sw 14-16s-16e, Miss 1523 ft, abnd 1610 ft.

Pratt County—Failure: Paul Hatfield et al's Grapes 1, se nw nw 10-28s-15w, Misener 4572 ft, Simp 4702 ft, Arb 4812 ft, abnd 4865 ft.

Rooks County—Failure: El Dorado Rfg. Co.'s Bubbe 1, se nw se 20-7s-16w, Topeka 2668 ft, KC 2932 ft, Arb 3292 ft, abnd 3320 ft.

Rush County—Failures: Adair & Morton's Schlitter 1, sw se ne 18-16s-17w, Lans 3282 ft, Reagan 3532 ft, abnd 3553 ft.

Sunray's Jacobs 1, sw sw nw 3-16s-19w, Reagan 3622 ft, abnd 3640 ft.

Russell County—Failure: Phil-Han's Meir 1, nwc 30-15s-12w, Lans 3042 ft, Arb 3368 ft, abnd 3375 ft.

Sedgwick County—Failure: Phillips' Kellogg 1, ne ne se 36-25s-3w, abnd 4138 ft.

Sedgwick County—Oil Discovery: Branine & Sandy Holl's Sutter 1, sec ne 22-29s-2w, pump 205 bbls oil, 55 bbls wtr, 1000 gals acid 3010-36 ft.

KENTUCKY WILDCATS

Butler County — Failures: I. B. Green's Blaine 1, 7-H-32, abnd 440 ft.

I. B. Green et al's Arnold 1, 15-H-32, abnd 643 ft.

Henderson County—Failure: Ashland O&Ref Co.'s Jennings 1, 19-O-25, abnd 2354 ft.

MICHIGAN WILDCATS

Allegan County—Failures: Lewey Michmershuizen's Boven 1, ne nw ne 7-4n-15w, Traverse 1470 ft, abnd 1559 ft.

S. L. Findely's Meyaard 1, nw nw nw 13-4n-14w, abnd 1619 ft.

Mason County—Failures: Marks and Shiffman's Carter 1, nw sw sw 12-17n-16w, Sylvania sd 3107 ft, abnd 3276 ft.

Osceola County—Failure: Sun's State A-1, s½ se sw 35-19n-9w, Dundee, abnd 4118 ft.

MISSISSIPPI WILDCATS

Jefferson Davis County—Failure: Sinclair Wyoming's Newman Lbr Co. 2, c sw sw 31-6n-18w, elev 290 ft, Sparta 2293 ft, Wilcox 3184 ft, Eutaw 8570 ft, Tuscaloosa 8650 ft, abnd 11,644 ft.

Jones County—Failure: Sinclair Wyoming's Wassau Lbr. Co. 2, 660 fr el 330 fr sl ne nw 25-8n-10w, elev 325 ft, logged Wilcox 1970 ft, Midway 4600 ft, Eutaw 5940 ft, Tuscaloosa 6405 ft, abnd 7815 ft.

Madison County — Failure: Vaughey & Vaughey's Covington-Edgar 1, c se se 19-10n-4e, elev 289 ft, logged Wilcox 1256 ft, Midway 3275 ft, Clayton 4040 ft, Chalk 4103 ft, Eutaw 5111 ft, abnd Wilburn 5121 ft.

MISSISSIPPI OUTPOST

Jasper County—Heidelberg Extension: Kingwood Oil Co.'s E. V. Hill 1, se ne 4-10n-10w, elev 309 ft, perf 12 shots 4931-33 ft, pump 170 bbls oil, 7% basic sediment & wtr, 5½-in 5004 ft, td 5018 ft.

MONTANA WILDCATS

Liberty County—Gas Discovery: Texas Co.'s Laas 1, nw sw sw 14-33n-4e, East Utopia, 5,000,000 gas Madison, td 2610 ft.

Pondera County—Failure: Union of Calif.'s John England 1, c sw se 11-25n-2w, Collins area, sulphur wtr Ellis-Madisn 1632 ft, abnd 1644 ft.

Yellowstone County—Failure: Carter's N. P. 1, c sw se 15-4n-26e, Crooked Creek, Amsden 5653 ft, Madison 6390 ft, abnd 6590 ft.

Teton County—Failure: Union of Calif.'s Carlson 1, se sw se 29-25n-3w, Farmington area, abnd 1769 ft.

Toole County—Failure: Texas Co.'s Hurley 1, sw se nw 9-35n-1e, East Van Block, Madison 2120 ft, 1500 ft sulphur wtr, sso 2105-09 ft, abnd 2123 ft.

Yellowstone County — Failure: Carter Oil Co.'s Crow Tribal 1, c sw nw 17-2s-29e, Mifflin Dome, Madison 4001 ft, abnd 4284 ft.

NEW MEXICO WILDCATS

Debaca County—Failure: Frank Griggs et al's Steele Ranch Co. 1, ne ne ne 26-4n-24e, elev 4248 ft, San Andres 667 ft, Glorietta 1460 ft, Abo 3050 ft, abnd in Pennsylvanian 5550 ft.

Eddy County—Failure: Ross-Luck & Cunningham's Cowan 1, 3630 ft nsl 2310 ft wel 3-21s-28e, elev 3286 ft, anhydrite 535 ft, base Rustler 725 ft, lime 1100 ft, abnd 1340 ft.

NEW MEXICO OUTPOST

Lea County—Vacuum Extension: Devonian Oil Co.'s State 1, c se sw 32-17s-34e, 1½ mi w by s of prod, elev 4085 ft, anhydrite 1595 ft, salt 1670-2652 ft, swab 36 bbls, 7000 gals acid 4685-4729 ft.

OKLAHOMA WILDCATS

Cleveland County—Failure: Calif. Co.'s Wilson 1, ne se se 17-10n-1e, abnd 2588 ft.

Creek County—Failure: W. C. Norris' Ollier 1, se se nw 19-18n-10e, Butcher 2841 ft, Miss 2877 ft, abnd 2905 ft.

Hughes County—Oil Discovery: W. N. Bartlett-Ashland Rfg. Co.'s Smith 1, nw sw ne 27-6n-8e, pump 10 bbls oil, 5 bbls wtr, fr 2665 ft, td 3411 ft.

Lincoln County—Gas Discovery: Anderson-Prichard's Elkenburg 1, nw nw se 8-14n-6e, Prue 3207 ft, flow 7,500,000 gas, rp 1310 lbs, td 3215 ft.

Okfuskee County—Oil Discovery: Phillips' Fixico 1, se nw nw 10-12n-7e, pump 38 bbls oil, 50 bbls wtr, 3000 gals acid 4198 ft, td 4528 ft.

Seminole County—Failures: Kerlyn Oil's Goss 1, ne nw 35-8n-5e, Dolo 4622 ft, 2nd Wx 4628 ft, abnd 4674 ft.

Gulf's Reed Est. 1, ne ne nw 34-9n-7e, 2nd Crom 3450 ft, abnd 3460 ft.

WEST TEXAS WILDCATS

Andrews County—Failure: Stanolind's Midland Farms Co. 1-J, 660 ft wel 2013 ft nsl G&MMB&A sec 32, blk 41, T-2-N, elev 3017 ft, anhydrite 1880 ft, Yates 3090 ft, Grayburg 4550 ft, abnd 4876 ft.

Borden County — Failure: Northern Ordnance's Clayton-Johnson 1, nw nw nw T&P Ry. 32, blk 31, T-4-N, elev 2481 ft, anhydrite 1040 ft, Yates 1470 ft, stray salt 2555-2980 ft, black shale 5420 ft, Ellenburger 9450 ft, abnd 9499 ft in surf wtr.

Crockett County—Failures: Phillips' Schneeman-Schnee 1, c ne sw T.C. Ry. sec 46, blk BB, elev 2606 ft, abnd in Ellenburger water 9916 ft.

Watchorn O&G Co.'s Thompson 1, 660 ft out swc I&GN Ry. sec 73, blk 1, elev 2165 ft, Yates 630 ft, brown lime 1330 ft, base Permian 5680 ft, detrital 5772 ft, Pennsylvanian 5870 ft, Crinoidal 6435 ft, Simpson 6680 ft, Ellenburger 7360 ft, abnd 7640 ft.

Howard County—Failure: John B. Hawley, Jr.-Northern Ordnance's Guitar 2, 1669 ft snl 2298 ft wel sec 18, blk A, Bauer-Cockrell sur, elev 2539 ft, abnd 3302 ft.

Lynn County—Failure: Texas Co.'s Tunnell 1, c nw nw E.L. Ry. Co. 451, blk 1, elev 3032 ft, anhydrite 1700 ft, Yates 2250 ft, San Andres 3490 ft, salt beds 6250-60 ft, abnd in water 6690 ft.

Yoakum County — Failure: Honolulu Oil Corp.'s Hertel-Texaco 1, c se nw sec 264, blk D, J. H. Gibson sur, elev 3607 ft, anhydrite 2390 ft, brown lime 4170 ft, San Andres 4370 ft, abnd 5400 ft.

WEST TEXAS OUTPOST

Howard County—Iatan-East Howard Extension: L. C. Harrison et al's Snyder 1, nw nw nw T&P Ry. 20, blk 30, T-1-S, 1⅜ miles sw of field, elev 2399 ft, pump 45 bbls 28-gr, shot 920 qts nitro 2665-3020 ft, td 3051 ft.

WEST CENTRAL TEXAS WILDCATS

Jones County—Failure: Hunt Oil Co.'s Rennels 1, c nw sw BBB&C Ry. sec 193, elev 1517 ft, abnd 3325 ft.

Shackelford County — Failure: Fortex Oil Corp.'s G. Smalley 1, 1800 ft nsl 1600 ft ewl E.T. Ry. sec 13, abnd 1031 ft.

WEST CENTRAL TEXAS NEW PAY TEST

Fisher County — Howard Deep Failure: Northern Ordnance's B. Yantis 1, c se se H&TC Ry. 182, blk 2, Howard lime 3687 ft, abnd 6010 ft.

SOUTH CENTRAL TEXAS WILDCATS

Caldwell County — Failure: Magnolia's Strawn 3, 1136 n&w of No 1 330 fr nel 990 fr nwl 672-ac tr, J. S. Montgomery sur, abnd 1425 ft.

Guadalupe County—Failure: Wiegand Bros.' Paul and Emma Baumert 2, 1000 se of No 1, 330 fr swly swl 1330 fr nwl 227-ac lse, M. Besore sur, abnd 2617 ft.

Zavala County—Failure: Humble's Ike T. Pryor 1, 660 fr sel 1980 fr swl sect 44 subdvn 1, Zavala Land & Wtr. Co Tr, Pedro Jose Aguirre Gr, 30,000-ac blk, abnd 5867 ft.

SOUTHWEST TEXAS WILDCAT

Duval County—Failure: R. Thomas McDermott's Seferino Herrera 1, 330 fr e&wl 82-ac lse 2310 fr sl lse, sur 167, elev 790.8 ft, Cole 1704 ft, abnd 3216 ft.

LOWER TEXAS COAST WILDCATS

Goliad County—Oil Discovery: Continental's Victoria Albrecht et al 1, 330 fr sel 2550 fr nel 800-ac lse, Manuel Carriona sur A-308, 3 mi s se Cabeza Crk field, 9 mi nw of Goliad, perf 48 shots 8340-60 ft, flow 45 bbls 14 hrs 58.8-gr, 14,500,000 gas, ¼-in, tp 2475 lbs, cp 125 lbs, td 10,958 ft.

Jackson County—Failure: P. R. Rutherford-Royal O&G Corp.'s Paul Skarpe 1, 467 fr e&sl 117-ac lse 2850 fr el 5300 fr nl J. Heard Lge, 1 mi s Stewart field, abnd 6750 ft.

Karnes County—Condensate Discovery: Anderson Pritchard's Edmonia Tenberg W-1, 467 fr se&swl blk 2, 177-ac lse, Jas. Johnson sur 164, Burnell area, perf 264 shots 6735-68 ft, flow 3,995,000 gas, 70 bbls cond, ¼-in, sitp 2525 lbs, td 6953 ft.

Lavaca County — Condensate Discovery: Sterling O&G Co.'s Mary Hoffman et al 1, 600 fr sel 725 fr swl 100-ac lse, D. B. Oakes sur, 12 mi se of Yoakum, perf 144 shots 7716-50 ft, flow 2,486,000 gas, 50 bbls cond, 3/16-in, td 9003 ft.

Live Oak County—Soquat Outpost Discovery: Henderson Coquat's Idell Custer 1, 660 fr nwl 660 fr swl 100-ac lse, H. Waller sur 4, sand 7516 ft, perf 48 shots 7542-48 ft, gas-cond, no gge, shut in, td 8043 ft.

Refugio County—Failure: Hewit & Dougherty's Jamie Hynes B-1, 2000 fr sel 7377.7 fr swl 1500-ac lse, Power & Hewitson sur, 21 mi n of Refugio, abnd 6515 ft.

Willacy County—Failure: Sinclair Prairie's F. L. Burns 1, 660 fr wl 660 fr el 660 fr nl lot 10 and of 116-ac lse, Gulf Coast IRR Co. subdvn, San Juan de Carricitos Gr 51, td 9015 ft.

TEXAS GULF COAST WILDCATS

Colorado County—Failure: Quintana Pet. Co.'s H. R. Cullen et al 1, 2072 n 37° e of Hiway 71 660 sely at ra fr m/nwly/nwl of 588.7-ac lse, Chas. Fordtran sur, 10 mil n of Columbus, ns, completed as wtr well at 2283 ft.

Harris County—Oil Discovery: Eltex, Ltd.'s Bender Est. 1, 330 fr nl 330 w fr el 282.9-ac lse, Mary C. Bulrice sur A-129, ½ mi s of Spring, elev 90 ft, Cockfield 6239 ft, perf 6243-47 ft, flow 128 bbls 38.3-gr oil, 0.2% wtr, ⅛-in, td 6249 ft.

Jefferson County — Failure: Stanolind's Stanolind Fee Caswell Tr. 1, 2342.8 fr el 2277.5 fr sl 891.8-ac tr, W. D. Dyches sur, 12 mi w of Beaumont, abnd 7700 ft.

Wharton County—Failure: Humble's Donald & F. B. Duncan B-2, 3420.8 sw of nel 7738 nw of sel David Wade sur 64, 1284 w of nwc of Chas. Gillis tr, 3000-ac lse 5.6 mi nw of Hungerford, show sw, abnd 7350 ft.

TEXAS GULF COAST OUTPOST

Ft. Bend County— Thompson Failure: General Crude Oil Co.'s Warren Hill 1, 330 fr n&wl 40-ac tr 2655 w of Naylor's Shanks 3, H. Chriesman sur, abnd 8250 ft.

TEXAS GULF COAST NEW PAY TEST

Ft. Bend County—Needville Oil Discovery: British American's Hurta 1, 660 fr nwl 467 fr swl 50.05-ac tr, Robt. Hodge sur A-33, 6000 swly fr Goldston's W. F. Lehman 1, sand 6029 ft, perf 46 shots 6025-32 ft, flow 110.7 bbls 26.6-gr oil, 29% wtr, 3/16-in, td 6849 ft.

The OIL WEEKLY'S TRADING POST

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■ FOR SALE IN EAST TEXAS — 4,000'—7" 24 lb. casing, 4,000'—5½" 17 lb. and 20 lb. casing, 9,000'—2½" upset tubing, 7—87' Ideco pumping derricks, 3 galvanized, 4 painted. Owned by independent producer and reasonably priced. V. Sapp, 1204 Republic Bank Building, Dallas, Texas.

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11	Boxes, Relay panel #1777176.
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24	Covers, Unilet, various sizes.
11	Ells, Factor, 1½".
75	Insulators, various types.
3	Motors, Allis Chalmers, 40-15 H.P., 440-V, 60 cycle, 3 Phase, 50/18.7 Amp., 860 RPM, Induction.
1	Motor, Allis Chalmers, 50 H.P. with Slide Rails.
2	Motors, General Electric, 40-15 H.P.
2	Motors, Westinghouse, 35-15 H.P., 440-V, 60 cycle, 3 Phase, 49/25 Amp., Induction.
6	Nipple, 1½" x 9" Conduit.
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3—125 H.P. 350 W.P. F & T Boilers—completely reconditioned.
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1—13⅝" Cameron SDA blowout preventer 3000-lb. test with 13⅜" master valve, all accessories and 4½" & 5½" rams.
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1—300 Ton Ideal swivel, reworked, late type.
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1—Oil Well 12 x 12 horizontal steam engine, piston type, complete.
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2—15½ x 7¾ x 20 Gardner-Denver steam slush pumps, 350-lb. steam ends.
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6000' 4½" Flashweld, Range II drill pipe, bottlenecked.
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60,000' 6⅝" T. & C., 20, 24 & 26-lb., Range I, excellent condition.
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FOR SALE—FOB Houston

1—Emsco Type HRB Draw Works with 8" RB, guaranteed first class condition	$3500.00
1—14 x 7¼ x 20 Gardner Denver Steam Slush Pump, guaranteed first class condition	1500.00
1—GB 6 Emsco Double Deck Crown Block—Fair Condition	750.00
1—12 x 12 Gardner Denver Slide Valve Drilling Engine—Good condition	1500.00
1—14 x 7¼ x 14 Gardner Denver Steam Pump—Good Condition	800.00
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1—14¼ x 7¼ x 18 Ideal Steam Slush Pump—some work needed	500.00
6000' 4½" Drill Pipe W/Reed Full Hole Tool Joints—Good Condition Per ft.	1.10

Above prices are net to purchaser. For inspection see L. F. Rollins, 1714 Neils Esperson Building, Fairfax 1753.

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9,000 feet 3½" O.D., Range 2, Drill Pipe with Hughes Acme Regular Tool Joints.
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■ Petroleum or Mechanical Engineer with several years field experience in well completion and production preferably in the Gulf Coast area to promote sales of technical oil field services and equipment. Permanent position with good future for man with imagination, intiative, and genuine interest in sales engineering. Give full details of education, experience, and availability in first letter. All replies held confidential. Box 1. c/o The Oil Weekly, Houston, Texas.

■ Wanted, an ambitious man, under forty, to promote sales and service of oil well pumping equipment; interesting work with good post war aspects; engineering and oil production background desirable; initiative and ability to develop sales essential. Address: Box 14, c/o The Oil Weekly, Houston, Texas.

■ WANTED: By major oil company, 5 tool pushers for Venezuela. Salary commensurate with experience and ability. Single status. Must have certificate of availability. Address: Box 16, c/o The Oil Weekly, Houston, Texas.

■ WANTED: Two micropaleontologists for Bogota, Colombia, South America. Major oil company. Salary commensurate with ability and experience. Must have certificate of availability. Address: Box 17, c/o The Oil Weekly, Houston, Texas.

SITUATIONS WANTED

■ Man with fifteen years experience as roughneck, driller and toolpusher, steam and mechanical rigs, desires connection with oil company operating outside United States. Single. Read and write English and Spanish. Do some mechanical drawing. Now employed but immediately available. Address: Box 15, c/o The Oil Weekly, Houston, Texas.

GEOLOGIST with best available experience in secondary recovery engineering and core analysis seeks responsible connection with company presently engaged in secondary recovery operations or planning to investigate possibilities of secondary recovery. Can procure release from present position on two weeks notice. Address: Box 18, c/o The Oil Weekly, Houston, Texas.

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■ CAPITAL SEEKERS: Interested in raising $25,000 or more should write to Amster Leonard, Fox Bldg., Detroit 1, Michigan.

BUSINESS OPPORTUNITY
Large Independent Oil Company desires high class business man who has contacts with wealthy clientel in the East to place meritorious drilling blocks having good geology. Position permanent and amply remunerative depending upon results. Prefer man experienced in oil business. State reference, age, and salary required. Address P. O. Box 1075, Dallas, Texas.

NOTICES

■ GEORGIA OIL REPORTS: 6 mo. sub. $6. Get posted. Keep posted. Also Base and County maps So. Ga. and North Fla. C. W. Deming, Waycross, Ga.

NORTH TEXAS WILDCATS

Archer County—Failure: M. R. Stipe et al's Calvin 1, 1252 ft wel and 161 ft nsl sec 1, S.F.I.W. sur A-443, abnd 1161 ft.

Clay County—Failures: W. A. Baber et al's Bentley 1, 1550 ft snl and 1425 ft ewl blk 51, Specht-McCutchin sur, abnd 1397 ft.

W. T. Jones et al's Henry-Estep 1, 150 ft snl and 1150 ft wel blk 62, Byers sur, abnd 1156 ft.

Cooke County—Oil Discovery: Kadane-Griffith Oil Co.'s Hopkins 1, nw nw nw BBB&C Ry. 18, A-150, conglomerate 2974 ft, flow 105.72 bbls 39.6-gr, natural via ½-in, sand 2978-87 ft, td 2983 ft.

Cooke County—Failure: Northern Ordnance's Solomon 1, 330 ft nsl 330 ft fr m/e/el of 321½-ac tr, W. G. Hunt sur A-493, elev 877 ft, Ellenburger 4903 ft, abnd 4974 ft.

Montague County—Failure: Gulf's Ferguson 1-E, 1100 ft snl 467 ft wel blk 62, W. Watson sur A-838, Bend 5578 ft, Ellenburger 5974 ft, abnd 6125 ft.

Young County—Failure: L. T. Burns et al's Jeffery 1-A, 1400 ft out nec TE&L Co. sec 41, abnd 4871 ft.

NORTH TEXAS NEW PAY TEST

Young County—Unnamed Pool Deep Pay Discovery: Fleming Oil Co.'s Graham 3, 330 ft out nwc TE&L Co. sec 2912, 1000 ft nw of Marble Falls 2-well area, elev 1210 ft, Bend 3767 ft, Marble Falls 4320 ft, Mississippi 4595 ft, pump 25 bbls, 15 bbls wtr, 500 gals acid Mississippi 4652-55 ft.

TEXAS PANHANDLE WILDCAT

Oldham County—Failure: Stanolind's Herring 1, 1805 ft nsl 5368 ft ewl Lge 307, State Capitol Lands, elev 3594 ft, jkd and abnd in lime 7279 ft.

WYOMING OUTPOST

Big Horn County—Garland Field Failure: General Pet. Corp.'s Williams 1, swc lot 51-56n-97w, Tensleep 4680 ft, 3340 ft wtr, abnd 4714 ft.

WESTERN CANADA WILDCAT

Southern Alberta Plains—Taber Failure: Imperial Oil-Phillips-R. L. Clancey's Imperial Clancey 3, lsd 4 27-8-16w4th, wtr in Ellis, Madison 3283 ft, abnd 3294 ft.

United States Wildcat Starts

ARKANSAS

Ouachita County: G. H. Vaughn's Halton 2, nwc ne se 28-15s-18w, lcn 4000-ft Nacatoch test.

Union County: Phillips' Callie 1, 658 s 553 e nwc 30-18s-12w, digging pits.

CALIFORNIA

Kern County: Amerada's S.P. 8-15, sw sw 15-29-29, Ant Hill area outpost test, rig.

Texas Co.'s K. C. L. 77-32, se se 32-29-25, Canal area outpost test, lcn.

Independent Exploration Co.'s 27-37, sw sw 34-39-28, Magunden area wildcat, lcn.

Independent Exploration Co.'s Salt Creek 1, ne se 17-29-21 Sheep Springs outpost test, lcn.

Rothschild-Bender's Sheep Springs 3, se se 17-29-21, Sheep Springs outpost test, lcn.

TricoO&G Co.'s Wood 1, sw nw 16-29-21, Sheep Springs outpost test, lcn.

San Luis Obispo County: Richfield Oil Corp.'s Temblor Unit 2-1, ne se 27-32-22, Temblor Hills wildcat, lcn.

Yolo County: Texas Co.'s Salisburg 1, nw nw 20-10-1, Woodland area gas test, lcn.

COLORADO

Larimer County: Iris Oil Co.'s No. 1, w½ sw 13-11n-69w, Round Butte, lcn.

ILLINOIS

Greene County: Texas Co.'s Coldren 1, sw se ne 4-11n-11w, drlg.

Marion County: Ashman's Charles 1, ne ne sw 26-2n-1e, lcn.

St. Clair County: Young's McCurdy 5, sw nw sw 29-3s-6w, lcn.

Wayne County: Hammer et al's Williams 1, sw nw se 3-2s-9e, lcn.

INDIANA

Dubois County: Hayden's Messmer 1, wl sw se 16-2s-5w, lcn.

Spencer County: Texas Co.'s Bettag 1, el se nw 25-4s-5w, lcn.

Wabash County: Texas Co.'s Kram 1, se se nw 1-28n-6e, lcn.

KANSAS

Barton County: Phil-Han et al's Lewis 1, sec se 3-16s-13w, rur.

Mouser Drlg. Co.'s Kath 1, se ne se 1-16s-13w, dr 2101 ft.

Ellis County: Sunray's Schnider 1, sec sw 32-15s-19w, lcn.

Foard County: Texas Co.'s Weatherbee 1, swc 17-29s-26w, lcn.

Hodgeman County: Texas Co.'s Goebel 1, ne ne se 16-21s-24w, dr 1420 ft.

Leavenworth County: Mosbacker's Sloan 1, swc ne 16-9s-22e, dr 270 ft.

Marion County: Texas Co.'s Weinbruner 1, sw nw nw 36-19s-1e, lcn.

Rice County: M. J. Sullivan's Kleile 1, swc 21-19s-8w, lcn.

Ben Hyde's Hammel 1, cel ne 16-19s-10w, lcn.

KENTUCKY

Daviess County: Miller & Shiarella's Payne 2, 18-O-27, lcn.

Sinclair Prairie's 1, Bartlett 7-O-28, lcn.

Henderson County: Ashland's Jennings 1, 19-O-25, comp.

Hageman Yingling et al's McCormick 1, 16-P-24, drlg.

Union County: Ashland & Basin's Young 1, 13-O-20, lcn.

NORTH LOUISIANA

Bossier Parish: V. H. Brown's Freestate 3, 780 w 340 s of c of 19-18n-13w, lcn Pettit Zone test.

Catahoula Parish: Stanolind's J. M. Jones 1, c se se 25-10n-8e, lcn 8700-ft rotary test.

Grand Parish: H. H. Temple's N. W. Homer 2, c of 38-6n-2w, lcn 2000-ft Sparta test.

LaSalle Parish: Atlantic's Q. T. Hardtner 1, 660 s 1080 w of nec 3-10n-2e, 4100-ft test, prep to spud.

SOUTH LOUISIANA

Cameron Parish: Phillips' Mermentau 1, c sw nw nw 17-14s-5w, Catfish Lake area, lcn.

St. Landry Parish: Mid-Continent's John Sonnier 1, start sec sect 31 go n 46° 20 mins w for 347 th 54° w 7308 th s 36° e 330 in 31-5s-4e, lcn 10,000-ft test.

MICHIGAN

Allegan County: Cook and Fortneys' Marron 1, sw sw se 31-3n-12w, lcn.

Ray Donnersberger's Krubee 1, sw se ne 8-3n-11w, rig.

Clinton County: McClure and Wadsworths' O'Connell 1, se sw se 4-8n-4w, rig.

Osceola County: Gordon Oil Co.'s Lakes 1, se se sw 15-20n-9w, lcn.

Saginaw County: American Drilling Co.'s Diener 1, ne se nw 4-12n-2e, lcn.

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MISSISSIPPI

Clarke County: Kirby Pet. Co.'s Long Bell Pet. Co. 1, c nw nw sw 30-1n-18e, mi.

Itawamba County: Gregg Tex Gas-Oline Oil Co.'s R. L. Burdine 1, ne ne se 16-11n-9e, clearing lcn.

Lamar County: Sinclair Wyoming's Newman Lbr. Co. 3, c ne sw 5-5n-16w, lcn 10,000-ft test.

Simpson County: Jesse McKee's J. B. Bishop 1, c nw se 13-2n-1e, lcn.

MONTANA

Big Horn County: C. H. Mulcahy's 1, c sw 25-1n-32e, Harding area, lcn.

Liberty County: Texas Co.'s Cicon 1, ne nw sw 29-36n-6e, Keith Prospect, lcn.

Teton County: Texas Co.'s Price 1, ne se ne 12-27n-5w, West Pondera, lcn.

NEW MEXICO

Eddy County: Culbertson & Irwin et al's Iles 1, c nw se 4-20s-31e, lcn 2500-ft cable test.

Hardin County: Neill-Adams & McGahey's Gallagher 2, c nw se 5-21n-30e, lcn.

Neill-Adams & McGahey's State 2, se se se 28-21n-30e, lcn.

Lea County: Atlantic's J. E. Stevens 1, c ne ne 33-14s-33e, lcn for 5000-ft test with big hole for possible deepening to Clear Fork.

Cade & Harrell's Prior 1, c sw sw 11-20s-32e, lcn 2500-ft cable test.

OKLAHOMA

Canadian County: Amerada et al's Lawson 1, ne se nw 18-11n-5w, dr 2020 ft.

Haskell County: Phillips' Sammons 1, se ne 22-9n-21e, lcn.

Hughes County: Deep Rock's Bailey, Jr., 1, ne nw se 20-7n-11e, dr 2676 ft.

Kay County: Moffitt & Harris' Carrol 1, ne sw sw 24-28n-1e, sd 1182 ft.

Lincoln County: Davon Oil's McLaury 1, se ne ne 33-17n-5e, dr.

WEST TEXAS

Crockett County: Richfield Oil Corp.'s Archie Bean 1, c sw nw GC&SF Ry. 13, blk UV, lcn 8000-ft Ellenburger test.

Howard County: Cosden Pet. Corp.-John I. Moore's Cosden Refinery 1, cn e sw T&P Ry. 38, blk 32, T-1-N, lcn 5000-ft Clear Fork test.

Lynn County: Texas Co.'s M. C. Edwards 1, c se se Georgetown Ry. sec 158, lcn 6500-ft test.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACTS OF CONGRESS OF AUGUST 24, 1912, AND MARCH 3, 1933

Of THE OIL WEEKLY, published weekly at Houston, Texas, for October, 1944.

State of Texas, County of Harris, ss:

Before me, a Notary Public in and for the State and County aforesaid, personally appeared A. L. Burns, who, having been duly sworn according to law, deposes and says that he is the Business Manager of THE OIL WEEKLY and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, Ray L. Dudley, 3371 Chevy Chase, Houston, Texas; Editor, Warren L. Baker, 1613 Woodhead, Houston, Texas; Managing Editor, J. Kent Ridley, 613 Branard, Houston, Texas; Business Manager, A. L. Burns, No. 7 Chelsea Place, Houston, Texas.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one percent or more of total amount of stock).

The Gulf Publishing Company, Houston, Texas; James Anderson, Houston, Texas; A. L. Burns, Houston, Texas; Jas. F. Carter, Jr., Tulsa, Okla.; Mrs. Mary Margaret Cashman, Houston, Texas; Bayard T. G. Dudley, Houston, Texas; Estate of Dr. N. L. Dudley, Deceased, Houston, Texas; Ray L. Dudley, Houston, Texas; Estate of W. S. Farish, Sr., Deceased, Houston, Texas; Wm. V. Gross, Utopia, Texas; Mrs. Anita S. Lane, Houston, Texas; Chas. H. Lane, Houston, Texas; Tom W. Nelson, Houston, Texas; Wallace E. Pratt, New York, N. Y.; J. Kent Ridley, Houston, Texas; Mrs. Maud G. Sterling, La Porte, Texas; R. P. Swinsky, New York, N. Y.; O. R. Waller, Chicago, Ill.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages, or other securities are: None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

A. L. BURNS, Business Manager.

Sworn to and subscribed before me this 21st day of September, 1944.

P. J. AUCOIN,
(Seal) Notary Public, Harris County, Texas.
(My commission expires June 1, 1945.)

Pecos County: Byrd & Frost's H. Giesecke-Gulf 1, ne ne nw H&GN Ry. 54, blk 11, lcn 3000-ft cable test.

Terry County: Leland Fikes-John Murchison's C. R. Alexander 1, 670 ft snl 542 ft ewl PSL 18, blk K, lcn 5500-ft San Andres test.

DeKalb Agricultural Assn.'s A. B. Jenkins 1, c ne ne sec 29, blk DD, J. H. Gibson sur, lcn 5500-ft San Andres test.

WEST CENTRAL TEXAS

Callahan County: R. S. Miesse et al's Mrs. Mollie Price 1, 220 ft snl 330 ft wel of lse, BBB&C Ry. sec 110, lcn 1350-ft cable test.

Coleman County: Anzac Oil Corp.'s Mrs. L. Williams 1, c nw GH&H Ry. 27, blk 1, lcn 3400-ft cable test.

Jones County: M. M. Travis et al's A. Nobles 2, 990 ft nsl 330 ft ewl of lse, or 330 ft ewl 7700 ft snl of B. Travenio sur No. 190, lcn 2250-ft cable test.

Shackelford County: Fortex Oil Corp.'s Gladys Smalley 2, 1960 ft nsl 1700 ft ewl E.T. Ry. sec 13, lcn 700-ft cable test.

SOUTH CENTRAL TEXAS

Medina County: John I. Moore's A. J. Wurzbach 1, 333 fr wl 990 fr sl 420-ac tr sect 37½, Juana Delgado sur 1, lcn 3500-ft test.

Milam County: C. P. Reed's A. L. Lucas et ux 1, 1994 ne of c of swl th nw at ra 330 to lcn in 380-ac lse, T. J. Chambers 2-Lge Gr, lcn 1600-ft cable-tool and rotary test.

Val Verde County: J. A. Green's John Ingram 1, 1480 fr wl 1320 fr nl ELRR 73, blk S2 1817, 7 mi n of Langtry, elev 1550 ft, lcn 4500-ft cable-tool test.

Zavala County: F. M. Ginter's C. D. Matthews 1, c blk 9 & 10 5940 fr nearest lse line 8½ mi nw LaPryor 7931-ac lse, I&GN sur, elev 800 ft, lcn.

SOUTHWEST TEXAS

Duval County: J. W. Gorman's M. V. Ruiz 1, 330 sw of nel 330 se of nwl 594 e of wl sur 44 330 sw of swl P. Garcia sur 1 330 se of nwl P. Garcia sur 2 346.6-ac lse, lcn 4000-ft test.

Webb County: Adams & Lyles' Prudencia de la Garza 1, 330 fr sl 990 fr wl 603.7-ac lse, sur 675, 8 mi n of Bruni, elev 850 ft, lcn 2400-ft test.

O. W. Killam's E. Garcia Heirs 3, 1400 fr el sur 609 1600 w nw of No 2, 640-ac lse, 5 mi se of Mirando City, lcn 3500-ft test.

Zapata County: Bridewell Oil Co.'s Maria T. G. Garcia et al 1, 2211-ac tr, Charco Redondo Gr sh A, 20 mi e of Zapata, lcn 2000-ft test.

LOWER TEXAS COAST

Jim Wells County: Naylor Oil Co.'s J. W. Bird 1, 330 fr el 1968 fr sl 425-ac lse, Los Presenos de Abajo Gr, Capt. Lucy area, lcn 10,000-ft test.

Smith & Story's Alfred Ehrig 1, 330 fr el 2302 fr sl 123-ac lse, sur 88, 14 mi n of Alice, lcn 3500-ft test.

Karnes County: Chas. Harris' Hilmer Monson 1, 330 fr ne&nwl 44-ac lse, P. B. Butler subdvn sur, 8 mi sw of Kenedy, lcn 3300-ft test.

Refugio County: P. R. Rutherford-Royal O&G Co.'s Henry Schirmer 1, 467 fr n&wl 160-ac lse Johnson & Pugh subdvn sur 25m 7 mi s of Woodsboro, lcn 6500-ft test.

Victoria County: Raymond D. Raynolds et al's Sallie E. Ragsdale 1, 1800 sw of swl of F. A. Gillespie & Sons Co. 80-ac lse, 1800 sw of nel 1000-ac lse, J. H. McConnaughey sur A-262, 5½ mi sw of Inez, lcn 5600-ft test.

Willacy County: Texas Co.'s Yturria Bros. Ld. & Cattle Co. 2, 660 fr nl sh 4 15,900 w of el 18,419.5-ac lse San Juan de Carricitos Gr, lcn. 9000-ft test.

TEXAS GULF COAST

Harris County: Eltex, Ltd.'s Mrs. Anna Scott 1, 150 nely at ra fr Cypress Crk Rd 800 sely at ra to m/sly/nl HT&B sur 1, 270.6-ac lse, 1½ mi e of Westfield, elev 94.6 ft, lcn 7500-ft test.

EAST TEXAS

Henderson County: Gulf's T. D. Frizzell 1, 1050 ft nsl 2150 ft ewl of David Cherry sur A-135, mi e of Baxter, rur for 10,000-ft Travis Peak test.

Hunt County: Homer W. Snowden et al's C. W. Gentry 1, 1600 ft fr m/e/el 330 ft fr m/n/sl 205-ac tr, or 1850 ft nsl 7500 ft ewl Shelby CSL sur, mim for Woodbine test.

Wood County: Bobby Manziel et al's V. L. Evans 1, 330 ft out nwc of 53.8-ac tr, or 800 ft snl 1800 ft wel of J. Stark sur, 2 mi e Quitman, dk to Paluxy test.

NORTH TEXAS

Archer County: Alexander Goldsmith et al's Kemp-Kempner 1, se se sw S.P. Ry.-KWVFL sec 5, A-418, lcn 5250-ft Ellenburger test.

Republic Natural Gas Co.'s W. L. King 1, 330 ft nsl 1420 ft ewl of tr in se part Wm. Henry sur A-163, dr 3915 ft.

A. P. Kouri et al (was Elmer Frerich's) W. A. Keys 2, 1280 ft nsl 1100 ft wel sec 17, J. S. Swisher sur A-396, lcn 1150-ft test.

C. E. Morrison and Maguire Industries' Wm. McGregor-Coleman 1, 150 ft nsl 750 ft ewl lot 7, Brazos CSL sur, testing sand 877-884 ft.

Clay County: Anderson-Prichard Oil Corp.'s R. O. Wood 1-A, 990 ft out nec sec 12, MEP&P Ry. A-339, lcn 6700-ft Ellenburger test.

Nixon Pet. Co.'s W. R. Lyons 1, 200 ft ewl 870 ft nsl blk 52, Byers sur, lcn.

Collin County: Pure's Geo. E. Light 1, 2529 ft snl 2062 ft ewl of 950-ac tr, John Ragsdale sur, slim-hole test, dr 4105 ft.

Grayson County: Seitz-Comegys & Seitz-Humble's J. B. Walling 1, 330 ft out swc of 480-ac tract, Sarah Gross sur, lcn 5000-ft test.

WYOMING

Natrona County: Stanolind's Boone Dome Unit 1, nw se sw 10-35n-85w, Boone Dome, lcn.

Uinta County: Mt. Fuel Supply Co.'s No. 1, c sw nw 8-16n-112w, Church Buttes structure, lcn 10,000-ft test.

WESTERN CANADA

Southern Saskatchewan — Swift Current: Norcanols O&G's Swift Current 1, lsd 11 20-13-13w3rd, ru.

☆

JOHN L. BIBLE has resigned as supervisor of the gravity meter and magnetometer departments of the Stanolind Oil and Gas Company, Tulsa, to become executive vice president and treasurer of the North American Geophysical Company, Houston.

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ROPE

CONSERVATION NOTE BOOK—

Page 8
ACIDS DESTROY ROPE
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Widening Horizons

When girdles disappear, the masculine outlook will be broadened.

The Squelchers

"You remind me of the ocean."
"Wild reckless, romantic?"
"No, you just make me sick."

No Help

"Joe must have had a lot to drink at the party last night."
"How's that?"
"Well, when I was taking him home he let me fall down twice."

Higher Goal

Little Boy (before tonsillectomy): "I'll be brave, Mother, but I don't want a crying baby like you got at the hospital last time. I want a pup!"

His Dime's Worth

"Daddy, if you will give me a dime, I'll tell you what the ice man said to Mama."
"O. K., son, here's your dime."
"He said: 'Do you want any ice today, lady?'"

A Bride's Thoughts

The demure young bride, her face a mask of winsome innocence, slowly walked down the aisle, clinging to her father's arm. As she reached the platform before the altar her dainty foot brushed a flower pot, upsetting it. She looked at the dirt gravely, then raised her childlike eyes to the old minister and said sweetly, "That's one hell of a place to put a lily."

He Couldn't Win

Wife (to drunken husband): "Dear, let's go to bed."
Husband: "Might as well. I'll catch hell when I get home, anyway."

Raised His Sights

"At her request you gave up drinking?"
"Yes."
"And you stopped smoking for the same reason?"
"I did."
"And it was for her that you gave up dancing, card parties and billiards?"
"Correct."
"Then why didn't you marry her?"
"Well, after all this reforming I decided I could do better."

Vicious Circle

Down in Cuba they are in a rut. They raise cane to make rum and drink rum to raise Cain.

Thrives on It

He: "Do you shrink from kissing?"
She: "If I did, I'd be nothing but skin and bones."

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Overnight delivery of "Dressers" to the Southwest from complete stocks at Houston

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Notes for the Equipment Buyer and User

Portable V-Vise

REIMULLER BROTHERS COMPANY

Reimuller Brothers Company, 9400 Belmont Avenue, Franklin Park, Illinois, has perfected a preciison V-vise to hold or handle material. The unit can be mounted vertically and used for a production press on small preciison upsetting, heading and other small operations requiring dies or tooling.

Two levers are used in the hydraulic foot-control, one to apply pressure up to rated tonnage, the other, which has two speed returns, for release.

The vise is portable in that it is equipped with flexible hydraulic hose. Two sizes are available: 4-ton with a 4-inch opening, and 7-ton with 7-inch opening.

Jones & Laughlin Selects Houston Sales Manager

Jones & Laughlin Steel Corporation has announced appointment of D. J. Ambrose as district sales manager of the Houston office, effective October 1.

D. J. Ambrose

Ambrose has been assistant district sales manager of the company's Cincinnati, Ohio, office since February.

He succeeds Frank Winslow who has resigned.

Lincoln Tank Company Properties Purchased

The National Tank Company has purchased the properties and business of the Lincoln Tank Company, consisting of welded and bolted tank shops at Shreveport, welded tank shops at Electra, Texas, and wood tank shops at Big Spring, Texas. W. B. Lincoln, who founded the Lincoln Tank Company, is retiring from business but most of the personnel formerly employed by the Lincoln Tank Company has been retained by the purchaser.

Two Books Published on Production Technology

American Petroleum Institute, 50 West 50 Street, New York 20, announces publication of two new books on petroleum production technology.

"Fundamental Research on Occurrence and Recovery of Petroleum" (1943) is authorized by the Board of Directors' Committee on Research. It is the first of a series of annual publications containing all papers relating to the Instiute's important program of fundamental research on occurrence and recovery of petroleum.

The second publication, "Criteria for Determining Oil Fields' Susceptibility to Secondary-Recovery Methods," sponsored by the Institute's Standing Subcommittee on Secondary-Recovery Methods (Paul D. Torrey, chairman) is a supplement to "Secondary Recovery of Oil in the United States," published by the Institute in 1942. It contains all the papers delivered at the symposium on secondary recovery at the Institute's twenty-fourth annual meeting in 1943.

The book on fundamental research (clothbound) is priced at $3.50, and the supplement on secondary recovery (paper-covered) is $1, postpaid in the United States. Orders should be sent to the Institute.

Magnetometers

RUSKA INSTRUMENT CORPORATION

Production of magnetic surveying instruments and of two new magnetometers based on the Schmidt design has been started by Ruska Instrument Corporation, Houston.

Both instruments are vertical magnetometers, one being a standard field instrument with a sensitivity of ten gammas per scale division, and the other a recording and visual base instrument of a new design.

The latter can be set up in the open without the necessity of a dark room, since the photographic recording mechanism is an integral part of the instrument. This instrument has the telescopic arrangement of the visual magnetometer so the field operator can check in on the base station at any time and take visual readings without disturbing the recording.

The relation between the visual reading and the recording are such that one scale division in the eye-piece corresponds to a millimeter deflection on the photographic record.

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If you need Steel warehouse material, contact Patterson—The Largest Stocks South of St. Louis assures you a greater selection and faster service.

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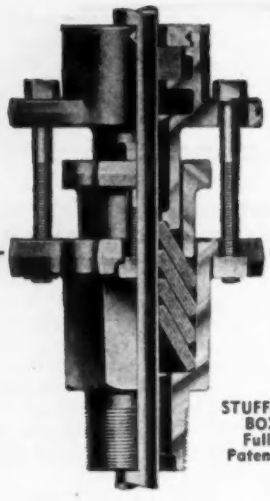

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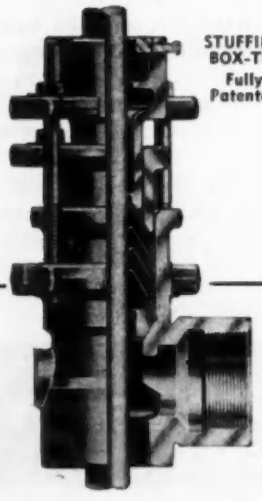

STUFFING BOX-TEE Fully Patented

CARL ST. JOHN BREMNER, chief geologist of the California-Ecuador Petroleum Company, a subsidiary of Standard Oil Company of California, was killed in a plane crash near Lima, Peru, September 18. Born in San Francisco in 1895, Bremner was graduated from the University of California in 1921. He joined Standard of California in 1923.

E. D. LOUGHNEY, Gulf Oil Corporation, Tulsa, has been elected president of the Petroleum Accountants Society of Oklahoma. Other officers include G. E. Votrian, Bareco Oil Company, vice president; Riley Frick, Tide Water Associated Oil Company, second vice president; J. L. Shoemaker, Stanolind Pipe Line Company, secretary-treasurer. R. L. Rush, Sinclair Prairie Oil Company, was elected a director for three years.

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TUBING CATCHER

The outstanding advantage of the DOUBLE E Multiple Step Tubing Catcher is that it protects the tubing without distorting the casing. This is accomplished by the multiple step design, which permits an extra large gripping surface, distributing the load over a much greater area than other catchers. Note the illustration at left. The simplicity of design and the heavily sectioned parts of this tubing catcher naturally are points of importance in providing long and economical life.

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